Vol. 934 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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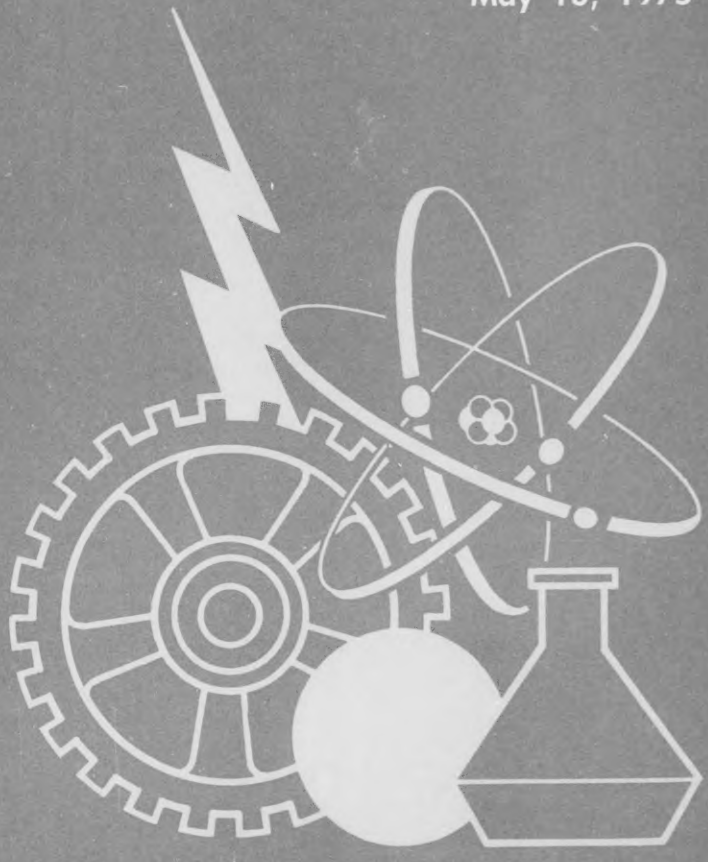
May 13, 1975



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

May 13, 1975 Volume 934 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Restriction Between Inventions

The practice set out in the notice of June 20, 1968 (852 O.G. 509) is hereby revised as follows.

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent or distinct.

If it is demonstrated that two or more claimed inventions have no disclosed relationship ("independent"), restriction should be required, and it is not necessary to further show that the claimed inventions are distinct. If it is demonstrated that two or more claimed inventions have a disclosed relationship ("dependent"), then a showing of distinctness is required to substantiate a restriction requirement.

Where inventions are neither independent nor distinct, one from the other, or they are not sufficiently different to support more than one patent, their joinder in a single application must be permitted.

Every requirement to restrict has two aspects, (1) the reasons (as distinguished from the mere statement of conclusion) why the inventions *as claimed* are either independent or distinct, and (2) the reasons for insisting upon restriction therebetween.

In order to support a requirement to restrict between combination and subcombination inventions, two-way distinctness must be demonstrated.

If it can be shown that a combination, as claimed (1) does not require the particulars of the subcombination as claimed for patentability, and (2) the subcombination can be shown to have utility either by itself or in other and different relations, the inventions are distinct. When these factors cannot be shown, such inventions are not distinct.

Two or more claimed subcombinations, disclosed as usable together in a single combination, and which can be shown to be separately usable, are usually distinct from each other.

In applications claiming inventions in different statutory categories only one-way distinctness is needed to support a restriction requirement. For example, in applications containing claims to both process and apparatus, distinctness may be shown if (1) the process as claimed can be practiced by hand or by another materially different apparatus, or (2) the apparatus as claimed can be used to practice another and materially different process.

As in the notice of May 1, 1974 concerning Markush-Type claims (922 O.G. 1016), if the search and examination of an entire application can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it includes claims to distinct or independent inventions.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Apr. 9, 1975.

Certificates of Correction for the Week of May 13, 1975

P.P. 3,605	3,816,535	3,852,474	3,863,944
P.P. 3,655	3,818,074	3,852,483	3,863,969
Re. 28,253	3,821,383	3,852,734	3,864,338
D. 233,431	3,821,895	3,853,575	3,864,484
D. 234,462	3,824,224	3,854,954	3,865,221
D. 234,463	3,834,361	3,854,975	3,865,342
3,607,096	3,834,892	3,855,209	3,866,079
3,625,827	3,835,229	3,855,237	3,866,164
3,642,500	3,837,220	3,855,825	3,866,432
3,644,414	3,838,008	3,855,854	3,866,493
3,658,458	3,838,459	3,856,399	3,866,734
3,673,207	3,839,399	3,856,811	3,867,066
3,714,115	3,839,405	3,856,959	3,867,125
3,727,942	3,840,514	3,857,274	3,867,147
3,737,478	3,840,874	3,857,363	3,867,320
3,738,790	3,841,039	3,857,903	3,867,439
3,744,420	3,841,361	3,858,606	3,867,862
3,745,820	3,842,372	3,858,780	3,867,922
3,770,340	3,843,635	3,858,852	3,868,007
3,779,523	3,844,080	3,859,092	3,868,058
3,784,648	3,844,286	3,859,319	3,868,504
3,791,546	3,845,293	3,859,417	3,868,653
3,793,368	3,846,520	3,859,581	3,868,671
3,798,457	3,847,211	3,859,698	3,868,713
3,799,799	3,848,365	3,859,880	3,869,260
3,802,907	3,849,426	3,859,930	3,869,365
3,803,860	3,849,428	3,860,326	3,869,475
3,805,260	3,849,454	3,860,450	3,869,802
3,805,736	3,849,468	3,860,644	3,869,906
3,806,712	3,849,517	3,861,542	3,870,020
3,807,901	3,849,523	3,861,742	3,870,120
3,810,602	3,849,545	3,862,250	3,870,221
3,814,379	3,849,800	3,862,837	3,870,427
3,814,749	3,851,081	3,863,198	3,871,423
3,816,122	3,851,375	3,863,409	3,871,588
3,816,163	3,851,581	3,863,464	3,872,852
3,816,300	3,852,180	3,863,772	3,873,874
3,816,459	3,852,345	3,863,939	3,873,953

Disclaimer and Dedication

3,215,266.—*Robert L. Dreyfus,* Arlington, Mass. PACKAGING. Patent dated Nov. 2, 1965. Disclaimer and dedication filed July 10, 1974, by the assignee, *W. R. Grace & Co.*

Hereby disclaims and dedicates claims 1–8 and 11 of said patent to the Public.

Disclaimers

2,978,678.—*Wayne D. Winger* and *Philip W. Jackson,* Wappingers Falls, and *Victor R. Witt,* Poughkeepsie, N.Y. DATA TRANSMISSION SYSTEM. Patent dated Apr. 4, 1961. Disclaimer filed Feb. 15, 1974, by the assignee, *International Business Machines Corporation.*

Hereby enters this disclaimer to claims 1 through 20 of said patent.

2,999,816.—*Edward J. Bennett,* Newark, Del., and *Howard M. Parmelee,* Woodstown, N.J. AZEOTROPIC COMPOSITION. Patent dated Sept. 12, 1961. Disclaimer filed July 2, 1974, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to the sole claim of said patent.

3,040,300.—*Edward J. Rabenda,* Poughkeepsie, and *Maurice A. Every,* Wappingers Falls, N.Y. DATA SELECTOR. Patent dated June 19, 1962. Disclaimer filed Feb. 15, 1974, by the assignee, *International Business Machines Corporation.*

Hereby enters this disclaimer to claims 1 through 12 of said patent.

3,104,051.—*John Henning* and *Carl W. Hobgood,* Evansville, Ind. ANTI-SLUGGING DEVICE FOR MOTOR-COMPRESSOR UNITS. Patent dated Sept. 17, 1963. Disclaimer filed Jan. 31, 1975, by the assignee, *Americold Compressor Corporation.*

Hereby disclaims the remaining term of the patent subsequent to Dec. 31, 1974.

3,199,402.—*Robert W. G. Hunt,* Wealdstone, and *Peter Bernard Watt,* Stonyhall, Stevenage, England. PRINTING APPARATUS FOR COLOR PHOTOGRAPHY. Patent dated Aug. 10, 1965. Disclaimer filed Sept. 19, 1973, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to claim 1 of said patent.

3,515,574.—*Lionel C. Montgomery,* North Olmsted, Ohio. METHOD FOR METALLIZING A BORON NITRIDE CONTAINING BODY. Patent dated June 2, 1970. Disclaimer filed Mar. 5, 1975, by the assignee, *Union Carbide Corporation.*

Hereby enters this disclaimer to claims 1–16 of said patent.

3,684,425.—*John M. Ross,* Wilmington, Del., and *Harvey I. Stryker,* Carneys Point, N.J. PROCESS FOR DYEING PAPER WITH DIAZO DYESTUFFS AND COMPOSITIONS THEREFOR. Patent dated Aug. 15, 1972. Disclaimer filed Feb. 26, 1975, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to claim 3 of said patent.

3,721,858.—*Kunio Shimizu,* Osaka, Japan. SIZE AND HIGH VOLTAGE STABILIZING CIRCUIT. Patent dated Mar. 20, 1973. Disclaimer filed Apr. 25, 1974, by the assignee, *Sanyo Electric Company, Limited.*

Hereby enters this disclaimer to claims 1 through 14, inclusive and 19 through 22, inclusive, of said patent.

3,789,235.—*Thomas James Bridges,* Holmdel, and *Van-Tran Nguyen,* Matawan Turnpike, Monmouth County, N.J. FAR INFRARED COHERENT RADIATION SOURCE EMPLOYING CHARGE CARRIER SPIN NONLINEARITY IN A MAGNETIC FIELD. Patent dated Jan. 29, 1974. Disclaimer filed July 2, 1974 and Feb. 5, 1975, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1, 2 and 5 of said patent.

3,805,044.—*Ranendra K. Bhattacharyya,* Kendall Park, N.J., and *Angelo Ralph Fiore, Jr.,* Westville, and *David William Rudd,* East Derry, N.H. COMPUTER PROCESS CONTROL SYSTEM FOR THE GROWTH OF SYNTHETIC QUARTZ CRYSTALS. Patent dated Apr. 16, 1974. Disclaimer filed Dec. 10, 1974, by the assignee, *Western Electric Company, Incorporated.*

Hereby enters this disclaimer to claims 1, 2, 4, 5, 6, 8, 12 and 13 of said patent.

Patents Available for Licensing or Sale

3,467,405. LEVER DOLLY TYPE INDUSTRIAL SEWING MACHINE MOVER. Walter K. Fogg, 45 Kensington St., Feeding Hills, Mass., 01030.

3,636,925. SUN-DIAL REVOLVING STRUCTURES. Wesson A. Kirkman-Sp 135, 10035 Mills Station Road, Sacramento, Calif., 95827.

3,664,754. HAND DRILL ALIGNMENT DEVICES AND METHODS OF MAKING AND USING THE SAME. Donald L. Kelbel, 5469 Ruskin, St. Louis, Mo., 63115.

3,821,859. DREDGE LADDER AND HOLDING SPUD SHOCK MOUNTING ARRANGEMENTS. William A. McWatters, Forest Hills Apartments, U–14, Route 273, New Castle, Del., 19720.

3,834,042. COMPUTATION DEVICE. James L. Henry, 3010 S. 74th E. Ave., Tulsa, Okla, 74129.

3,843,170. JOINTS FOR CONDUITS HAVING A CONTINUOUS CORROSION-RESISTANT LINING. Luigi Bagnulo, Milan, Italy. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,851,535. SPECIAL BELT AND PULLEY RIM TRANSMISSION DEVICE, Shelly M. Presentey, Ottawa, Canada. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,853,157. PROCESS AND APPARATUS FOR DISPENSING LIQUID COMPOSITIONS INTENDED FOR PARENTERAL ADMINISTRATION. Anthony J. Madaio, Correspondence to: Pennie & Edmonds, 330 Madison Ave., New York, N.Y., 10017.

3,863,629. LIFE SUPPORT SYSTEM AND REBREATHER. Gordon E. Ries. Correspondence to: Sherman Levy, Suite 635-Washington Bldg., 15th & New York, Ave., NW., Washington, D.C., 20005.

3,864,046. MECHANICAL PENCIL, ESPECIALLY FOR THIN LEADS. Kemal Butka, New York, N.Y., Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y. 10017.

3,865,194. HYDRAULICALLY-OPERATED FIRE EXTINGUISHING DRILL. John F. Chatfield, Jr., 44 Adams Road, Easton, Conn., 06612.

3,866,487. PULLEY DRIVE SYSTEM. The Hoover Company, General Offices and Main Factory, North Canton, Ohio, 44720.

3,868,662. MOBILE HOME ANCHOR STRAND TENSION INDICATOR. Levi Russell, Jr., P.O. Box 461, Ballinger, Tex., 76821.

3,869,863. ROTARY STEAM VAPOR AND EXTERNAL COMBUSTION ENGINE. Mark A. Juge, 8591 Willings Way, Fair Oaks, Calif., 95628.

3,871,325. MARINE DRIVE SYSTEM. Sidney W. Raulerson. Correspondence to: G. P. Edgell, Schuyler et al., 1000 Connecticut Ave. NW., Washington, D.C., 20036.

The International Business Machines Corporation hereby grants to any party a nonexclusive, royalty-free license to make, use and sell apparatus, within or without the U.S. Government, which employs the data encryption information published in the Federal Register of March 17, 1975, Vol. #40, Fed. Reg. 12134–12138 for consideration in the Federal standard-making process, or complies with an encryption standard based on such information, or complies with a revised standard based on such information and using alternate cryptographically secure functions, under:

a. all claims in U.S. Patent No. 3,796,830 entitled "Recirculating Block Cipher Cryptographic System" issued March 12, 1974 in the name of John Lynn Smith, and U.S. Patent No. 3,798,359 entitled "Block Cipher Cryptographic System" issued March 19, 1974 in the name of Horst Feistel; and

b. all those claims in any other United States patent, which is presently assigned to IBM or which is hereafter assigned to IBM, the infringement of which claims could not be avoided by any apparatus which can be constructed and operated for the purpose of employing the published data encryption information or complying with the standard(s).

Such license extends throughout the United States and includes a royalty-free immunity from suit, with respect to apparatus which employs the published data encryption information or complies with the standard(s) and is manufactured in the United States, under any and all foreign patents now or hereafter assigned to IBM, the infringement of which could not be avoided by any apparatus which can be constructed and operated for the purpose of employing the published data encryption information or complying with the standard(s).

In the event that the standard is not established by the Department of Commerce by September 1, 1976, then such license shall extend only to apparatus manufactured after the date of publication of this notice and prior to September 1, 1976.

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IBM will grant to any party a written license confirmatory of the rights set forth herein on written request to IBM Directory of Commercial Development, International Business Machines Corporation, Armonk, N.Y. 10504.

The General Electric Company is prepared to grant nonexclusives licenses under the following 8 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Switchgear Equipment Bus. Div., General Electric Co., 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,858,015. ELECTRIC CIRCUIT BREAKER OF THE GAS BLAST TYPE.

Applications for license under the following 3 patents may be addressed to: General Electric Co. Appliance Components Business Div., 1635 Broadway, Fort Wayne, Ind., 46804, Attn: Patent Counsel.

3,746,894. DYNAMOELECTRIC MACHINE VIBRATION ISOLATION MOUNTING ARRANGEMENT.

3,861,025. METHOD FOR TESTING AND BALANCING DYNAMOELECTRIC MACHINE ROTOR END RINGS.

3,866,567. MASKING APPARATUS FOR USE IN COATING AN ARTICLE OF MANUFACTURE.

Applications for license under the following 4 patents may be addressed to: General Electric Co., Division Patent Counsel, Housewares Bus., Div., 1285 Boston Ave., Bridgeport, Conn., 06602.

3,840,030. DETANGLING DRYER.

3,849,902. COLLAPSIBLE HAIR DRYER.

3,850,180. HAIR DETANGLER.

3,850,181. HAIR DETANGLER.

RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 36 patents.

Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

3,863,331. MATCHING OF SEMICONDUCTOR DEVICE CHARACTERISTICS.

3,864,172. BATTERY CONNECTING ASSEMBLY.

3,864,548. MACHINE FOR READING ARTICLE CARRYING CODED INDICIA.

3,864,590. ELECTRON DISCHARGE DEVICE HAVING A HOLLOW CONDUCTOR INTEGRAL WITH THE ENVELOPE THEREOF.

3,864,592. ELECTROLUMINESCENT SEMICONDUCTOR DISPLAY.

3,864,641. HIGH-INPUT-IMPEDANCE AMPLIFIER.

3,864,685. REPLACEABLE FLUID CARTRIDGE INCLUDING MAGNETICALLY OPERABLE FLUID JET DEVICES.

3,864,696. PRINTING APPARATUS.

3,864,722. RADIATION SENSING ARRAYS.

3,864,733. CONTROL SIGNAL APPARATUS FOR VIDEO DISC PLAYER.

3,865,488. FINGERPRINT DISPLAY SYSTEM UTILIZING A STORED FINGERPRINT.

3,865,655. METHOD FOR DIFFUSING IMPURITIES INTO NITRIDE SEMICONDUCTOR CRYSTALS.

3,865,997 TRIANGULAR PIEZOELECTRIC TRANSDUCER FOR RECORDING VIDEO INFORMATION.

3,866,025. SPACECRAFT ATTITUDE CONTROL SYSTEM.

3,866,080. INLINE ELECTRON GUN HAVING MAGNETICALLY PERMEABLE PLATES FOR ENHANCING CONVERGENCE OF ELECTRON BEAMS.

3,866,118. MICROWAVE SPECTROMETER.

3,866,149. FOUR-PORT JUNCTION CIRCULATOR HAVING LARGER DIAMETER CONDUCTIVE POST CONTACTING GYROMAGNETIC POST.

3,866,209. CHARGE-TRANSFER DISPLAY SYSTEM.

3,866,227. DOPPLER TRACKER RECEIVER.

3,867,012. NOVEL LITHIUM NIOBATE SINGLE CRYSTAL FILM STRUCTURE.

3,867,108. ACOUSTO-OPTIC DEVICES AND PROCESS FOR MAKING SAME.

3,867,144. SPECTRALLY SENSITIZED ELECTROPHOTOGRAPHIC MATERIALS.

3,867,165. METHOD FOR RECORDING FINGERPRINTS.

3,867,645. CIRCUIT FOR AMPLIFYING CHARGE.

3,867,651. MONOSTABLE SWITCHING CIRCUIT.

3,867,662. GRATING TUNED PHOTOEMITTER.

3,867,666. HIGH DENSITY LIGHT EMITTING DIODE ARRAY.

3,867,668. CATHODE-RAY TUBE HAVING AN INTERNAL-EXTERNAL MAGNETIC SHIELD AND DEGAUSSING COMBINATION.

3,867,685. FRACTIONAL CURRENT SUPPLY.

3,868,481. TRUNK FORMATTER.

3,868,537. AMPLIFIER WHICH CONSUMES A SUBSTANTIALLY CONSTANT CURRENT.

3,868,557. MOTION DAMPING APPARATUS.

3,868,581. CURRENT AMPLIFIER.

3,868,582. AF AMPLIFIER HAVING CONSTANT CURRENT CONSUMPTION.

3,868,588. MICROWAVE OSCILLATOR OR AMPLIFIER USING PARAMETRIC ENHANCED TRAPATT CIRCUITS.

3,868,687. TIME MEASURING SYSTEM.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 26, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-10-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-14-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-3-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-7-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-15-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-23-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-23-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Flumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Tesing; Indicating.	10-1-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-3-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-24-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-5-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	8-23-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-12-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-24-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-4-74

Expiration of patents: The patents within the range of numbers indicated below expire during May 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,832,959, to 2,836,825 inclusive
Plant Patents..... Numbers 1,698, to 1,713 inclusive

REISSUES

MAY 13, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

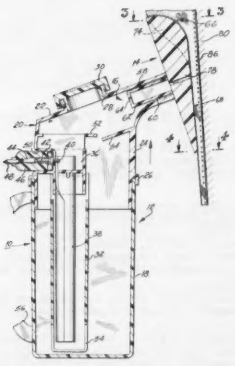
28,418
HAND STEAMER WITH IRONING SOLE

Leonard Osrow, Great Neck, N.Y., assignor to Osrow Products Co., Inc., Glen Cove, N.Y.

Original No. 3,690,024, dated Sept. 12, 1972, Ser. No. 162,404, July 14, 1971. Application for reissue Jan. 17, 1973, Ser. No. 324,533

Int. Cl. A47j *51/00*

U.S. Cl. 38—69 11 Claims



1. A light weight portable hand manipulable pressing/steaming device comprising an electrical steam generator, said electrical steam generator including means for receiving electrical energy and utilizing the same to convert water to steam, a passageway leading from the steam generator for receiving steam formed thereby, a steam discharge exit in communication with said passageway, a sole plate including a pressing section having means for pressing a fabric against a flat surface, said pressing section containing an opening therein in communication with said steam discharge exit, said sole plate made of a synthetic plastic which has a low coefficient of heat conductivity, a low specific heat, a high heat resistance, a high strength, a high dielectric coefficient, a high resistance to impact, a high flexural modulus, a heat distortion temperature in excess of 250° F. and a low rate of water absorption and the plastic being selected from the class consisting of polycarbonates, polyphenylene oxides, polysulfones, phenol formaldehydes, urea formaldehydes, epoxies, polytetrafluoroethylenes, polychlorotrifluoroethylenes, polyesters, silicones, alkyds, furans, diallylphthalates and caseins.

28,419
METHOD OF FABRICATING ALUMINUM ALLOY ROD

Roger J. Schoerner, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Original No. 3,670,401, dated June 20, 1972, Ser. No. 31,461, Apr. 1, 1970, which is a division of Ser. No. 814,183, Apr. 7, 1969, now Patent No. 3,512,221, which is a continuation-in-part of abandoned application Ser. No. 779,376, Nov. 27, 1968, which is a continuation-in-part of abandoned application Ser. No. 730,933, May 21, 1968. Application for reissue Apr. 29, 1974, Ser. No. 464,922

Int. Cl. B22d *25/00*

U.S. Cl. 148—2 15 Claims

7. Process for preparing an aluminum alloy rod *for subsequent use in the preparation of an aluminum alloy wire having a minimum conductivity of 61% IACS* comprising the steps of:

a. Alloying from about 98.95 to [about 99.54] *less than 99.45* weight percent aluminum, from about 0.45 to about 0.95 weight percent iron, about [0.01] *0.015* to about 0.15 weight percent silicon, and [from 0.0001 to] *trace quantities of no more than* 0.05 weight percent each of trace elements selected from the group consisting of vanadium, copper, *magnesium,* manganese, zinc, boron and titanium; the total weight percent of trace elements being [from 0.004 to] *no more than* 0.15 weight percent; [and the ratio of iron to silicon being at least 8:1;]

b. Casting the alloy into a continuous bar in a moving mold formed by a groove in the periphery of a casting wheel and an endless belt lying adjacent the groove along a portion of the periphery of the wheel; and

c. *Without any preliminary or intermediate anneals,* [Hot] *hot*-working the bar substantially immediately after casting while the bar is in substantially that condition as cast by rolling the bar in closed roll passes to obtain a continuous aluminum alloy rod [without having been subjected to any preliminary or intermediate anneals] *having a conductivity of less than 61% IACS.*

13. Process for preparing an aluminum alloy wire having substantially evenly distributed iron aluminate inclusions of a particle size of less than 2,000 angstrom units and an electrical conductivity of at least 61 percent IACS comprising the steps of:

a. Alloying less than about 99.70 weight percent aluminum with more than about 0.30 weight percent iron, [no more than] *0.015 to* about 0.15 weight percent silicon, and trace quantities of impurities;

b. Continuously casting the alloy into a continuous bar;

c. Continuously rolling the bar in substantially that condition in which it was cast into a bar to form a continuous rod;

d. Drawing the rod with no preliminary or intermediate anneals to form wire *having a conductivity of less than 61% IACS;* and

e. Annealing or partially annealing the wire.

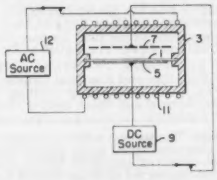
28,420
ELECTRET ACOUSTIC TRANSDUCER

Preston V. Murphy, Weston, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Original No. 3,612,778, dated Oct. 12, 1971, Ser. No. 25,539, Apr. 3, 1970, which is a continuation-in-part of abandoned application Ser. No. 638,463, May 15, 1967. Application for reissue Mar. 30, 1973, Ser. No. 347,322

Int. Cl. H04r *19/04*

U.S. Cl. 179—111 E 6 Claims



12. An electroacoustic transducer, comprising an electret, a metallic diaphragm, and means holding the

diaphragm stretched over and confronting a first surface of said electret, said electret comprising a relatively thick sheet of internally polarized dielectric material permeated with holes and having formed on said first surface a grid of supporting elements in contact with said diaphragm to form a plurality of individual transducing cells to control the spacing between the diaphragm and the electret and to prevent electrostatic sticking of the diaphragm to the electret, a meallic coating on a second side of said electret opposite said first side, a sheet of nonporous conducting material, means forming a chamber sealed at one end by said diaphragm and at an opposite end by said material, and a grid of nonconducting support elements in said chamber and supporting said electret above said material whereby the interstices between the support elements provide a compression chamber for said transducer, an electrical connection between one side of said material and said diaphragm, and an electrical connection between the other side of said material and said metallic coating.

PLANT PATENTS

GRANTED MAY 13, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,717
RASPBERRY PLANT

Marion Hagerstrom, Monticello, Minn., assignor to Herschel L. Boll, Champaign, Ill.

Filed Nov. 19, 1973, Ser. No. 417,429
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—46 1 Claim

1. A new and distinct variety of raspberry plant substantially as herein shown and described, characterized by its very vigorous growth; by its high productivity; and by its medium-sized, yellow-to-amber colored fruit.

3,718
STRAWBERRY PLANT

Albert B. Cook, Grandview, Ind., assignor to Herschel L. Boll, Champaign, Ill.

Filed Nov. 15, 1973, Ser. No. 416,295
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—49 1 Claim

1. A new and distinct variety of strawberry plant substantially as herein shown and described, characterized by its everbearing habit of growth; by its high productivity; by its vigorous growth; by its continuous bearing of fruit from June until freezing weather; by its continuous production of new flower stems, enabling one to pick some large primary berries at any time during the bearing season; and by its large, conic, orange-red fruit.

3,719
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91762

Filed Mar. 21, 1974, Ser. No. 453,385
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—14 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an extremely vigorous habit of growth, with production of exceptionally long and strong stems which are capable of supporting the heavy blooms well, an extraordinarily profuse blooming habit and excellent and amazingly rapid repetition of the blooming cycle when the plant is pruned back, the production of unusually long buds which open to large beautifully formed open flowers of a classic exhibition type and having many petals, a gardenia-like quality and unusually good substance of the flower petals which is uncommon in most white-flowered varieties, and a creamy-white flower color less than pure stark white, but, still definitely giving the flowers an overall white effect when the plants are in heavy bloom.

PATENTS

GRANTED MAY 13, 1975

ERRATA

For CLASS	See PATENT NO.
228–113	3,882,593
228–122	3,882,594
228–158	3,882,595
228–200	3,882,596
043–012	3,882,624
073–362	3,882,711
073–505	3,882,736
206–005	3,883,037
105–367	3,883,107
431–264	3,883,246
208–044	3,883,404
250–566	3,883,436
250–332	3,883,437
310–152	3,883,633

PATENTS

GRANTED MAY 13, 1975

GENERAL AND MECHANICAL

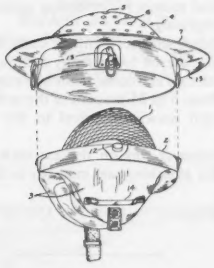
3,882,546
SAFETY HELMET WITH INDIVIDUALIZED HEAD-CONTOURED LINER

William G. Morton, 22 Rue Royale, Kettering, Ohio 45426

Continuation-in-part of Ser. No. 323,195, Jan. 12, 1973, which is a continuation of Ser. No. 805,299, March 7, 1969, abandoned. This application May 16, 1973, Ser. No. 360,950

Int. Cl. A42b *3/00*

U.S. Cl. 2—3 R **4 Claims**



1. An improved safety helmet assembly which is individualized to a wearer's head for distributing impact forces substantially uniformly over the head, comprising a substantially rigid dome-shaped outer helmet shell of generally uniform thickness, a dome-shaped inner shell of substantially uniform thickness and positioned within said outer shell, a deformable cap-like headpiece of generally uniform thickness and positioned within said inner shell to define a dome-shaped cavity therebetween, said headpiece being effective to receive the wearer's head and to conform to the contour of the head over the entire area covered by said headpiece, means for securing a lower edge portion of said headpiece to the corresponding lower edge portion of said inner shell and forming a fluid-tight seal around the bottom of said cavity, means defining an opening extending to said cavity to provide for introducing a fluid expandable plastics foam material into said cavity after said headpiece and said inner shell are positioned on the wearer's head, the expanded plastics foam material filling said cavity and having a substantially firm inner surface conforming to the contour of said headpiece and the wearer's head, said inner shell, said headpiece, said securing means and said expanded plastics foam material forming an individualized subassembly, and means for retaining said individualized subassembly within said outer helmet shell and providing for using said subassembly within different said outer helmet shells.

3,882,547
PADDING STRUCTURE

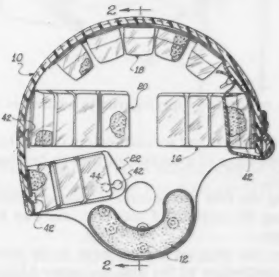
Gerard E. Morgan, Lake Forest, Ill., assignor to Riddell, Inc., Chicago, Ill.

Filed Oct. 9, 1973, Ser. No. 404,254

Int. Cl. A42b *3/02*

U.S. Cl. 2—3 R **14 Claims**

1. A padding structure for use in protective equipment whereby the structure can be fit to the wearer and will provide for energy attenuation upon receipt of an impact to which the wearer is subjected, said structure comprising a housing of flexible, substantially air-impervious material, a sandwich of resilient padding positioned within the housing, said sandwich comprising a first layer of slow-recovery material and a second layer of softer fitting material, and a backing for supporting the sandwich and housing whereby the housing and sandwich are disposed between the backing and the wearer's body when the protective equipment is in use, said first layer being positioned adjacent said backing and said second layer being disposed on said first layer with the wearer's body being immediately adjacent said fitting material, said fitting material being



normally partially compressed and said slow recovery material being uncompressed when the padding structure is in use whereby the padding structure snugly engages the body, and wherein said fitting material and said slow-recovery material are adapted to be substantially compressed when absorbing the force of an impact.

3,882,548
GLOVE FOR PROTECTION AGAINST INJURY

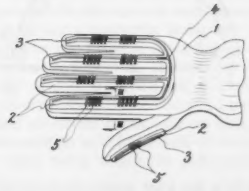
Koichiro Shinagawa, 12-6, 7-chome, Ryoke, Urawa-shi, Saitama-ken, and Kiyoko Takahashi, 15-15, 5-chome, Nonoue, Habikino-shi, Osaka-fu, both of Japan

Filed Sept. 26, 1974, Ser. No. 509,726

Claims priority, application Japan, Sept. 28, 1973, 48-112452

Int. Cl. A61d *13/10*

U.S. Cl. 2—161 A **10 Claims**

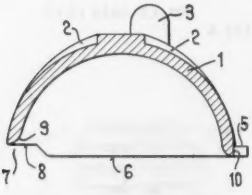


1. A protective glove comprising a body with finger portions and having an inner palm surface and an outer back surface, and a pad on each finger portion on the outer back surface of the glove body, each pad having a central longitudinal groove in the outer surface thereof, and thread means in said groove attaching the pad to the glove body solely thereat.

3,882,549
METHOD OF APPLYING GARMENT TRIM
Isabelle R. Gaburo, 410 E. Lexington, Apt. D, El Cajon, Calif. 92020
Filed Dec. 5, 1973, Ser. No. 421,945
Int. Cl.[2] A41D 27/08
U.S. Cl. 2—244 1 Claim

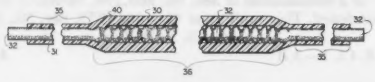
1. The method of applying trim to a garment comprising the steps of:
attaching a first and second section of bias tape to each side of one edge of a section of trim to be attached to a garment;
shaping the first and second sections of bias tape;
pressing the sections of bias tape and trim for setting their shape;
placing the edge of the garment to be trimmed between exposed edges of the first and second bias tape sections; and
attaching the garment to be trimmed to the exposed edges of the first and second sections of bias tape.

3,882,550
SOCKET FOR HIP JOINT PROSTHESIS
Kurt Karpf, Holderbank, and Heinz Moser, Selzach, both of Switzerland, assignors to Oscobal AG, Chirurgische Instruments und Implantate, Selzach, Switzerland
Filed Aug. 13, 1973, Ser. No. 387,622
Claims priority, application Switzerland, Sept. 6, 1972, 13067/72
Int. Cl. A61f 1/24
U.S. Cl. 3—1 8 Claims



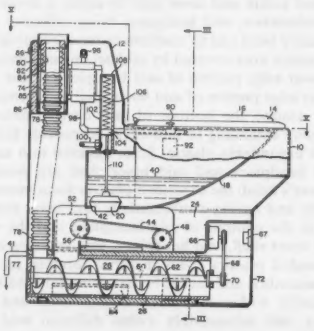
1. A socket for a hip joint prosthesis comprising a substantially hemispherical shell defining a substantially hemispherical cavity and terminating in a rim having a substantially annular face, said hemispherical shell defining a notch in a wall thereof interrupting the face of said rim from the outside of said shell to said cavity and over a section of the circumference less than half thereof, the face of said rim and at least a part of said notch being disposed respectively in two planes which are parallel to each other, said shell defining guide means for enabling precise positioning of the socket in the acetabulum.

3,882,551
ARTIFICIAL MUSCLE
Jerry D. Helmer, and Kenneth E. Hughes, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio
Filed Jan. 9, 1974, Ser. No. 432,101
Int. Cl. A61f 1/24
U.S. Cl. 3—1 9 Claims



1. An artificial muscle for complete replacement of a natural muscle comprising:
a. an elongated elastic member consisting of an elastic polymeric material biologically compatible with implantation, with said elastic member in a state of tension in the range of from 5 to 25 percent of the maximal tensile force of a normal muscle identical to the muscle being replaced;
artificial tendon means on the extremities of said elastic member for attaching said member to the skeletal system; and
c. means disposed to limit the extension of said elastic member.

3,882,552
SELF-CONTAINED WASTE TREATMENT SYSTEM
Abner B. Turner, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed May 2, 1973, Ser. No. 356,670
Int. Cl. E03d 5/014, 5/016; A47k 11/02
U.S. Cl. 4—10 8 Claims



1. A compact waste treatment system comprising:
a housing enclosing a bowl having a liquid therein adapted to receive solid-liquid waste materials;
a valve positioned to open or close a discharge opening in the bottom of said bowl, and selectively operable control means connected to control operation of said valve;
solid-liquid separation means mounted in said housing below said opening and in a position to receive the solid-liquid waste materials upon actuation of said valve to an open position;
incineration means enclosed in a container in said housing, said container having an inlet positioned to receive the solids in the waste materials which are separated from the liquid by the solids-liquid separation means;
said incineration means including a device for moving said solids therethrough, and heating means in said incineration means of sufficient capacity to completely incinerate said solids and thus form an ash residue;

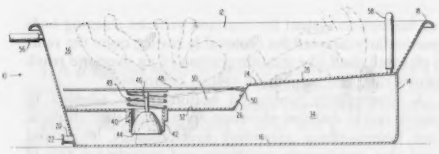
an ash residue outlet in said container, and removable disposal means in said housing adjacent said container outlet for receiving the ash residue from the incineration means;

a sump in the base of said housing which receives liquid from the solid-liquid separation means;

a motor driven pump responsive to said control means, said pump having an inlet connected to the sump and an outlet connected to liquid conditioning means which removes suspended solids and purifies said liquid; and

means connecting said liquid conditioning means with said bowl for furnishing the purified liquid thereto for bowl flushing and cleaning purposes.

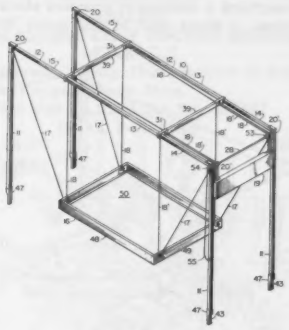
3,882,553
INFANT BATHTUB
Joseph Louis Poiencot, 504 Ash St., Houma, La. 70360
Filed Feb. 4, 1974, Ser. No. 439,007
Int. Cl. A47k *3/024*
U.S. Cl. 4—185 B **10 Claims**



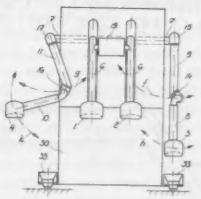
1. A safety bathtub for infants comprising: a tub having side, end and bottom walls, a false bottom spaced above said bottom wall and extending between said side and end walls thereby defining upper and lower chambers within said tub with said upper chamber of a size for bathing an infant, means carried by said tub providing for communication between said upper and lower chambers and including a normally closed valve disposed between said chambers for preventing communication of water from said upper chamber to said lower chamber, and means carried by said tub above said false bottom and responsive to the weight of an infant for opening said valve thereby to flow water from said upper chamber to said lower chamber and substantially empty said upper chamber.

3,882,554
RETRACTABLE BED
Frederic E. Glass, 448 W. 46th St., New York, N.Y. 10036
Continuation-in-part of Ser. No. 349,933, April 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 243,311, April 12, 1972, abandoned. This application Jan. 14, 1974, Ser. No. 433,232
Int. Cl. A47c *17/40*
U.S. Cl. 5—10 R **10 Claims**

1. A retractable bed comprising, in combination, a frame having transverse members and two pairs of legs supporting the ends of said transverse members to span a room adjacent to the ceiling, a bed platform smaller than the span of said room, support lines fixed to the cornes of said bed platform, pulley means at the ends of said transverse members over which said support lines run, slack take-up weights on said support lines beyond said pulley means limiting travel of said support lines over said pulley means securing said bed platform in a lowe sleeping position with said support lines extending upward and outward from the corners of said bed platform to said pulley means at the ends of said transverse members, four retracting lines extending vertically upward to said transverse members from the corners of said bed platform and extending slidably along said transverse members to extend downward adjacent to one pair of said legs, and a counterweight fixed to said retracting lines substantially balancing the weight of said bed platform as said platform is retracted upward against the ceiling, said slack takeup weights taking up slack in said support lines as said bed platform is retracted.



3,882,555
DEVICE TO LIFT PATIENTS
Karl-Johan Edlund, Ohbergsvagen 13, SF 22100 Mariehamn, Finland
Filed Apr. 30, 1973, Ser. No. 356,041
Claims priority, application Sweden, May 3, 1972, 1216/72
Int. Cl. A47b *83/04;* **A61g** *1/02*
U.S. Cl. 5—81 R **8 Claims**

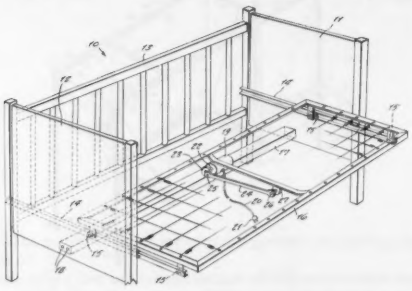


6. A lifting device which comprises a portable base means and a plurality of adjustable arm units supported by said base means and disposed to engage and thereby support the object to be lifted, said arm units each having a holding element disposed for supportive contact with said object, at least one of said arms having pivot connection means accommodating adjustment of the position of the holding element of that arm unit by independent horizontal and vertical movements, said base means including a moveable beam and said arm units being connected to said beam in spaced-apart relation therealong for movement therewith, said plurality of arm units including a pair of double-section arm units each having an inner arm section pivotally connected to a corresponding end portion of said moveable beam, and an outer arm section pivotally connected to said inner arm section, said double-section arm units being adjustable independently of each other.

3,882,556
ELECTRICALLY ROCKED CRIB
Serafino Accurso, 1137 67th St., Brooklyn, N.Y. 11219
Filed Mar. 4, 1974, Ser. No. 447,540
Int. Cl. A47d *9/02*
U.S. Cl. 5—109 **3 Claims**

1. In an electrically rocked crib, the combination of a stationary bed stead comprised of a headboard and footboard interconnected by side rails therebetween, so to form an en-

closure around a central area containing a horizontal member upon which a mattress can be supported, and means whereby said horizontal member is reciprocally sidewardly moved, said means comprising a stationarily mounted electric motor on said bedstead, a motor shaft of said motor having a plate

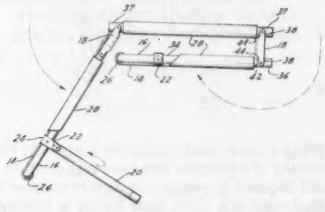


secured thereto, an eccentric pin on said plate being connected pivotally to one end of a connecting rod which at its other end moves said horizontal member, and means whereby said horizontal member travels an arcuate path that accordingly includes a vertical displacement as well as sideward movement.

3,882,557
RAISED SEAT PLATFORM

Richard C. Stehlik, 321 Sheridan Rd., Winnetka, Ill. 60093

Continuation of Ser. No. 212,018, Dec. 27, 1971, Pat. No. 3,742,529. This application July 2, 1973, Ser. No. 375,709
Int. Cl. A47c *27/08*; A47f *1/00*
U.S. Cl. 5—114 **5 Claims**



1. A foldable bed having a support platform area and adapted to be used with a raised seat, said bed comprising:

a substantially rectangular shaped frame including

a. a pair of substantially U-shaped end members,

b. a pair of intermediate members, and

c. two pairs of links pivotally connecting said end members and intermediate members together;

a flexible sheeting securely attached to said frame and forming the support platform;

a pair of swingable leg supports each connected to one side of the frame and adapted to cooperate with the raised seat to support the frame and flexible covering;

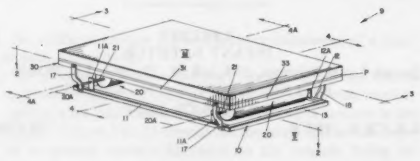
said connecting links having a pair of tab members at each end thereof pivotally connected to end portions of the end members and the intermediate members;

said tab members being formed by cut-out portions on opposite sides of said links, one cut-out being of lesser extent than the other whereby the end portions of the end members may be pivoted about the tabs and through the greater cut-outs for folding the bed into a compact condition and also for supporting the end members and the intermediate members by the portions of the links adjacent the lesser cut-outs when the bed is extended into an open position for engagement with the seat.

3,882,558
SUSPENSION SYSTEM FOR OVERLAND VEHICLES SLEEPING BEDS

Sheldon L. Christensen, 1963 E. 9th St., Fremont, Nebr. 68025

Filed Aug. 8, 1974, Ser. No. 495,624
Int. Cl. A45f *1/00*
U.S. Cl. 5—118 **9 Claims**



1. A suspension system for overland vehicles sleeping beds and particularly adapted for removably resting upon the rearward elevated shelf-like stratum portion of an overland truck operator's cab, said suspension system comprising:

A. A substantially horizontal bottom-frame adapted to stably rest at constant elevation upon a said shelf stratum, the bottom-frame extending longitudinally lengthwise and also transversely widthwise and including a pair of longitudinally separated transverse-ends, said bottom-frame being provided with a pair of longitudinally separated revolvable drums each rotatable about a transversely extending central-axis therefor whereby an elongated longitudinal-gap exists between the two central-axes;

B. A generally rectangular horizontal top-frame overlying the bottom-frame and in vertically reciprocatably movably attached relationship thereto through connnections to the respective revolvable drums, said top-frame extending longitudinally lengthwise and having a relatively narrow transverse-width and adapted to support a horizontal sleeping mattress thereabove;

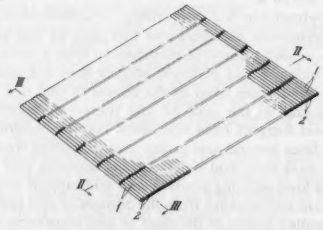
C. Leveling means to maintain the top-frame horizontal during vertical movements thereof; and

D. Downward-movement limitation means of the yieldable resistance type for the top-frame and extending actuatably therefrom to the constant elevation bottom-frame.

3,882,559
SHEET FOR BEDDING

Kazuyoshi Kano, 1-8-1-4, Minami-cho, Higashikurume-shi, Tokyo, Japan

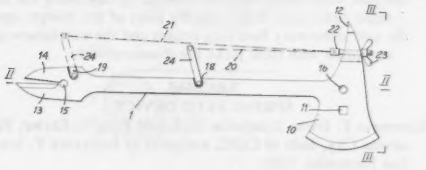
Filed Jan. 3, 1974, Ser. No. 430,583
Int. Cl. H47g *9/00*
U.S. Cl. 5—334 R **7 Claims**



1. A sheet for bedding comprising a plurality of short tubes constituted of relatively hard material and having opposite

open ends, said tubes being arranged in juxtaposition in rows and columns, said tubes having their axes lying in a common horizontal plane with their open ends facing one another, and means connecting said tubes in an assembled fashion in said horizontal plane in which they are individually freely movable, the open ends of said tubes being vertical.

3,882,560
COMBINED MULTI-PURPOSE IMPLEMENTS
Valentina Carrer, 10, Via Monte Focobon, Mestre-Favaro, Italy
Filed Apr. 4, 1973, Ser. No. 347,641
Int. Cl. B25f *1/02*
U.S. Cl. 7—8.1 R **6 Claims**



1. A combined multi-purpose implement comprising a basic member and complementary implement parts detachably secured thereto, said basic member comprising a substantially T-shaped member including a head and a shank, said head including a hatchet portion and a pick-axe portion at opposite ends thereof, said hatchet portion including a polygonal aperture therein adapted to serve as a spanner and said shank including a cutter device located at the end of said shank opposite said head, said implement parts including a soil working device detachably secured to said cutter device and adapted to be removed from the cutter device when the latter is to be used, and a hammer member detachably secured to a lateral face of said head, said implement further comprising mounting means on said shank, an anchoring member comprising a strut mounted by said mounting means and extending substantially transversely to said shank, anchoring and tensioning means secured to one of said head portions, and a flexible blade tensioned between said strut and said anchoring and tensioning means.

3,882,561
METHOD OF FITTING A SKI BOOT
Alden B. Hanson, and Chris A. Hanson, both of Boulder, Colo., assignors to Hanson Industries Inc., Boulder, Colo.
Division of Ser. No. 216,080, Jan. 7, 1972, Pat. No. 3,798,799.
This application Sept. 25, 1973, Ser. No. 400,667
Int. Cl. A43d *9/00*
U.S. Cl. 12—142 P **16 Claims**

1. The method of fitting a ski boot which comprises an outer shell and a liner assembly disposed within said shell, whereby at least one cavity is formed therebetween, said method comprising the steps of:

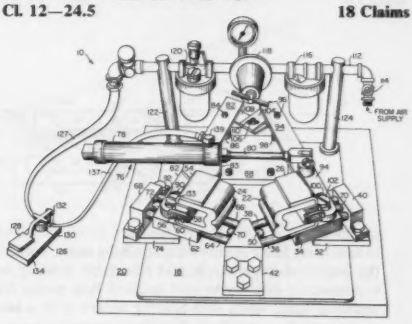
inserting a thermoplastic fitting material into said cavity;

heating said thermoplastic fitting material to a temperature substantially above ambient temperature;

shaping said liner assembly about the foot-to-be-fitted;

and thereafter cooling said thermoplastic fitting material to ambient temperature.

3,882,562
PLATFORM BINDING STRIP PINCHER METHOD AND APPARATUS
Alton R. Copithorne, Rowley, Mass., assignor to Boston Machine Works Company, Lynn, Mass.
Filed Mar. 12, 1974, Ser. No. 450,407
Int. Cl. A43d *43/06*
U.S. Cl. 12—24.5 **18 Claims**



1. A machine for pinching and folding a binding strip about a bevel of a workpiece, said machine comprising:

a. first resilient head means;

b. second resilient head means, said first and second resilient head means constrained for relative movement towards and away from each other between a first position and a second position; and

c. means for moving said first and second resilient head means towards and away from each other;

d. said first and second resilient head means in said first position operative to receive the binding strip and workpiece inserted therebetween, said first and second resilient head means operative to engage the binding strip about opposite edges of the bevel of the workpiece when said first and second resilient head means are urged towards each other by said moving means, said first and second resilient head means operative to apply a progressively increasing force against opposite edges of the bevel when said first and second resilient head means first engage the workpiece, said first and second resilient head means operative to apply a progressively increasing force against opposite edges of the bevel and against opposite faces of the bevel for folding and pinching the binding strip about the bevel as said first and second resilient head means are urged towards said second position.

3,882,563
HOLD-DOWN DEVICE FOR DOCKBOARD
Vernon O. Smith, Ashley, and George E. Mossbarger, Marion, both of Ohio, assignors to Overhead Door Corporation, Dallas, Tex.
Filed Sept. 6, 1973, Ser. No. 394,736
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **16 Claims**

1. In an adjustable dock leveler, the combination including:

a stationary mounting structure;

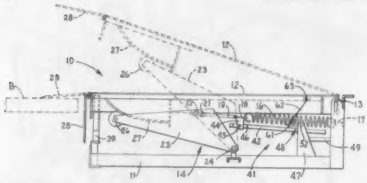
a ramp hingedly mounted on said stationary mounting structure for swinging movement about a substantially horizontal axis;

ramp lifting means coacting between said ramp and said mounting structure for substantially continuously urging said ramp to swing upwardly about said horizontal axis;

said ramp lifting means including a lifting arm pivotally supported on said support structure for swinging movement about a substantially horizontal pivot axis, said

lifting arm including means thereon coacting with said ramp for swinging said ramp upwardly in response to swinging movement of said lifting arm about its pivot axis; said lifting means further including resilient link means connected between said support structure and said lifting arm for continuously urging said lifting arm to swing in a direction for causing upward swinging movement of said ramp, said resilient link means being hingedly connected to said lifting arm; and

releasable holding means coacting between said ramp lifting



means and said support structure and acting in oppostion to said ramp lifing means for restraining same, comprising the improvement wherein said releasable holding means is connected directly to said resilient link means for restraining same when said holding means is in a latched position while permitting pivotal movement between said lifting arm and said resilient link means to enable said lifting arm to follow the upward swinging movement of said ramp as caused by application of an external force to said ramp.

3,882,564

PROCESS FOR CONSTRUCTION OF BRIDGES, IN PARTICULAR MOTORWAY FLYOVERS

Jean Muller, Suresnes, France, assignor to Societe d'Etudes de Genie Civil et de Techniques Industrielles, Paris, France

Filed Sept. 20, 1974, Ser. No. 507,798

Claims priority, application France, Sept. 24, 1973, 73.34133

Int. Cl. E01d *19/02*

U.S. Cl. 14—77 **4 Claims**

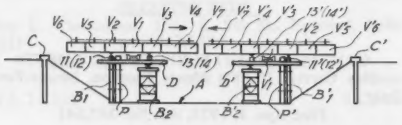
1. In a process for construction of a bridge with at least two piers and a continuous deck resting on the said piers, the said deck comprising at least a central span between two successive piers and two lateral spans extending respectively on either side of the said central span, the said process in particular comprising, to construct the said deck, assembling and fastening by means of prestressing reinforcements a plurality of prefabricated segments each having two opposed end faces, each segment being applied with one of its end faces against the adjacent end face of the immediately adjacent segment, the improvement comprising the following successive steps:

adjacent to each pier is erected a falsework having a substantially horizontal upper platform on which are arranged substantially vertical main jacks provided in their lower portions with sliding or rolling organs enabling the said jacks to slide or roll on the said platform;

the segments of a deck portion which comprises a fraction of the central span and at least a fraction of the lateral span associated with the pier in question are then placed successively in position over each of the said platforms, bearing on the said platform by means of the said main jacks, and the said segments are joined together by means of temporary fastening organs, the deck portion thus formed — which is supported by the said main jacks — then extending over the upper face of the pier in question and out of contact with the said face;

the main jacks supporting at least one of the two deck portions associated with two successive piers are then made to roll or slide on their platforms, so as to move the said two deck portions towards each other until their mutually facing end faces contact each other;

the segments of the assembly formed by the said deck portions are then permanently fastened together by means of prestressing reinforcements distinct from the temporary fastening organs used before, so as to form a continuous deck;



the said continuous deck is lowered by operating the said main jacks until it rests on the piers of the bridge; and

the said temporary fastening organs and the said falseworks equipped with their jacks are disassembled.

3,882,565

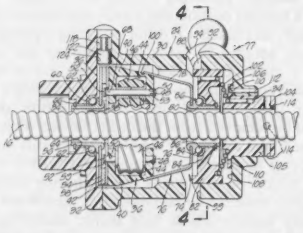
SPRING FEED DEVICE

Lawrence F. Irwin, Calabasas Park, and Fritz O. Ehrler, Panorama City, both of Calif., assignors to Lawrence F. Irwin, San Fernando, Calif.

Filed Nov. 30, 1973, Ser. No. 420,527

Int. Cl. B08b *9/02*

U.S. Cl. 15—104.3 SN **16 Claims**



1. A plumbing tool for use in cleaning out drains, conduits and the like comprising:

a. an elongated coiled spring plumbers snake,

b. means for rotating said plumbers snake about its longitudinal axis;

c. first means including snake engaging means movable into and out of operable engagement with said plumbers snake for feeding said snake in an axial direction, said first means also including first biasing means for yieldably holding said snake engaging means normally out of engagement with said snake;

d. second means movable into operable engagement with said first means for moving said snake engaging means into engagement with said snake against the urging of said first biasing means; and

e. second biasing means for yieldably urging said second means into operable engagement with said first means, said second biasing means being responsive to forces opposing axial feeding of said snake so that said snake engaging means will automatically move out of engagement with said snake in response to such forces.

3,882,566

DUCT CLEANING DEVICE

Clifton H. Hubbell, Downers Grove, Ill., assignor to Sauerman Bros., Inc., Bellwood, Ill.

Filed Apr. 24, 1974, Ser. No. 463,501

Int. Cl. B08b *9/02*

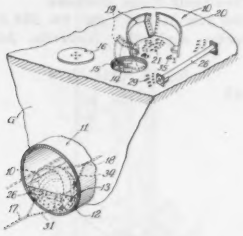
U.S. Cl. 15—104.3 R **11 Claims**

1. A device for cleaning out a duct having means for providing access thereto defining an opening having a cross section smaller than that of the duct, said device being utilized to

clean the duct by being dragged along the bottom of the duct by a drawn dragline so as to drag material collected in the duct to a removal position, said device comprising:

first wall means having a size preselected to permit passage thereof through said access opening into and from said duct;

second wall means having a size preselected to permit passage thereof through said access opening into and from said duct;



means for removably securing said first and second wall means together inwardly of said access opening to define an extended wall arrangement having a cross section larger than that of said recess opening and being preselected to be movable along the bottom portion of the duct for cleaning the duct; and

connecting means on said wall means for connecting a dragline thereto to effect such duct cleaning movement.

3,882,567

WIPER BLADE ELEMENT

Rudolf Herzog, Plochingen, Germany, assignor to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung, Dusseldorf, Germany

Filed June 12, 1972, Ser. No. 263,750

Claims priority, application Germany, June 16, 1971, 2129744

Int. Cl. B60s *1/38*

U.S. Cl. 15—250.36 **9 Claims**

1. An elongated windshield wiper element essentially consisting of

a. a unitary rubber strip having a body portion, a blade portion, and a hinge portion of reduced cross section integrally connecting said blade portion to said body portion, said blade portion having a base part contiguously adjacent said hinge portion and tapering from said base part in a direction away from said hinge portion to constitute a lip part, said portions extending over substantially the entire length of said strip; and

b. a thin, pliable coating of synthetic resin composition substantially impervious to ozone covering substantially the entire surface of said hinge portion and covering the surfaces of said body portion and said blade portion adjacent said hinge portion, said lip part having an exposed, longitudinal edge face of rubber, said edge face being free from said coating.

3,882,568

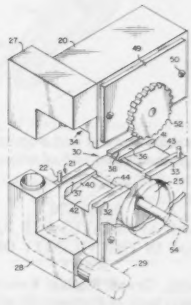
MOVIE FILM CLEANING SYSTEM

George P. Hill, 11525 Fourth Ave., N.W., Seattle, Wash. 98177

Filed Aug. 20, 1973, Ser. No. 389,571

Int. Cl. A47l *5/38*

U.S. Cl. 15—308 **4 Claims**



1. A cleaning device for movie film and the like comprising:

a housing assembly providing a vacuum plenum,

guide means for guiding the film endwise through the plenum such that the film divides the plenum into two vacuum chambers, said guide means comprising a front pair of guide grooves separated from one another by a front air intake and a rear pair of guide grooves aligned with the front pair and separated from one another by a rear air intake, said front pair being separated from said rear pair by a pair of side air intakes, said front, rear and side air intakes having a restricted height arranged to be divided by said film such that each of said chambers is served by respective front rear and side restriction air intakes,

a pair of opposed rotary brush means journal-mounted in said chambers and arranged and adapted to dislodge foreign particles from both faces of the film across the full width thereof, and suction means connected to said chambers for drawing air into said chambers through all of said air intakes simultaneously whereby air circulates over the side edges and entire surface of the film in the vicinity of the brush means.

3,882,569

SECTIONAL HANDLE

Fredric B. Vanderveer, Grand Rapids, Mich., assignor to Leigh Products, Inc., Coopersville, Mich.

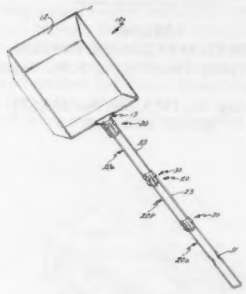
Filed Aug. 16, 1974, Ser. No. 497,908

Int. Cl. F16b *9/02*

U.S. Cl. 16—114 R **11 Claims**

1. A separable joint for a sectional article support, each section of said article support being an elongated, narrow loop of rod-like material having at least one closed end; a plate rigidly secured to one face of one of said sections at the end thereof remote from said closed end; said plate opposite from said one section to which it is secured, having means forming an elongated trackway parallel to said one section of a height and width to snugly and slidably receive the closed end of the other of said sections; said plate having a forward end and a rearward end, said forward end being adjacent the end of said one section; and rearward end having a rearwardly projecting

tongue spaced from the sides of said one section; a cooperating stop and latch means on said tongue; said tongue being



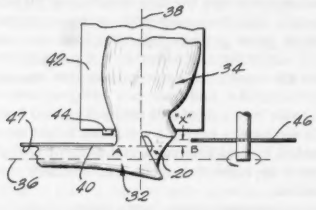
resiliently deflectable whereby said stop and latch means can detachably engage the closed end of said other section.

3,882,570

METHOD AND APPARATUS FOR REMOVING AN ANIMAL FOOT IN THE VICINITY OF THE TARSUS JOINT

Theodore C. Zwiep, Grand Rapids; Konrad H. Marcus, and Ferdinand Weitz, both of Holland, all of Mich., assignors to Prince Corporation, Holland, Mich.

Division of Ser. No. 14,503, Feb. 26, 1970, Pat. No. 3,657,771.
This application July 21, 1971, Ser. No. 164,781
Int. Cl. A22c
U.S. Cl. 17—1 R **12 Claims**



1. Apparatus for removing the foot portion of an edible mammal leg from the ham portion of the leg by cutting through the bone of the ham portion in the vicinity of the tarsus joint between said portions comprising:

a. first alignment means for establishing the alignment of the medial axis of the ham portion of the leg along a given axis;

b. second alignment means for aligning said foot portion to establish a predetermined amount of bending of said joint and thus a predetermined angle between the medial axes of said leg portions;

c. bending means for bending the joint said predetermined amount to establish said predetermined angle between said portions; and

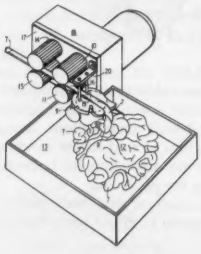
d. severing means located at a predetermined distance from the medial axis of said foot portion for severing the leg in the vicinity of said joint; said severing means having a cutting surface and means for directing said cutting surface for relative movement with respect to said leg on a path located along the medial axis of said foot portion, said path being located along a plane spaced said predetermined distance from the medial axis of said foot portion; means for causing relative movement of said severing means with respect to said leg along said path whereby said severing means will transversely cut only through a predetermined place of said bone of said ham portion.

3,882,571

SEPARATION OF ANIMAL INTESTINES FROM THE STOMACH

Roy James Evers, Cronulla, New South Wales, and Darcy Glen Perrett, Peakhurst, New South Wales, both of Australia, assignors to Davis & Geck Australia Pty. Limited, Hurstville, New South Wales, Australia

Filed July 31, 1973, Ser. No. 384,189
Claims priority, application Australia, July 31, 1972, 9904/72
Int. Cl. A22c *17/14*
U.S. Cl. 17—43 **7 Claims**



1. Apparatus for isolating tubular small intestine from the stomach of a beast, comprising an orientation horn having a longitudinal body freely supported near one end in a substantially horizontal position between one or more pairs of opposing carrying rolls, and a pair of substantially vertical guide pins, one on either side of the body of said horn to substantially prevent lateral displacement of said horn, said horn further having a leading end remote from the rolls over which a length of small intestine which has been initially manually separated from the stomach may be fed, said leading end of the orientation horn being hooked below the horizontal body of the horn so that said leading end is located adjacent a substantially horizontal rotary blade, which blade is adapted to sever the mesentery web holding the intestine tube to the stomach and the fatty tissue lining between the tube and the stomach when the tube is fed over and along the horn.

3,882,572

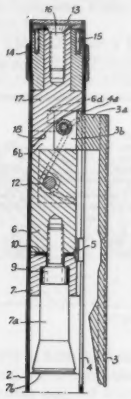
RETRACTABLE CLASP FOR A PEN OR THE LIKE

Robert Hocq, Boulogne, France, assignor to Interlight, Fribourg, Switzerland

Filed June 21, 1974, Ser. No. 481,880
Claims priority, application France, June 26, 1973, 73.23252
Int. Cl. B43k *25/00*
U.S. Cl. 24—11 S **19 Claims**

1. In a portable instrument having a side-wall comprising a clasp which is movable with respect to said wall between a first position received within a recess in said wall and a second projecting position, resilient means biasing the clasp toward the portable instrument, a push-button separate from the clasp and axially movable to actuate an inclined ramp within said instrument, a head on the clasp which is mounted to cooperate with said ramp and slide transversely with respect to the wall of the instrument, the improvement according to which said

head has an axial thickness substantially greater than the thickness of the clasp and a surface which engages guiding

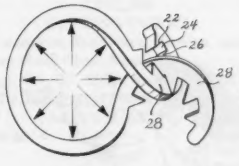


means contained inside the instrument and extending substantially the full length of the paths of travel of said head.

3,882,573
FLEXIBLE, REUSABLE FASTENER

Stanley E. Thomas, Jr., 74 Orchard Ave., Weston, Mass. 02193

Filed Jan. 2, 1974, Ser. No. 429,515
Int. Cl. B65d *77/10*
U.S. Cl. 24—30.5 T **4 Claims**



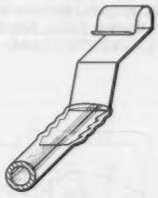
1. A flexible substantially planar, omega-shaped fastener comprising a resilient spring-like, loop-shaped body portion having planar front and back surfaces and integrally formed end portions which each terminate in oppositely facing hook-like segments, said hook-like segments each having a concave portion in which at least one inwardly extending notch is formed with each of said notches having a hook-end surface and a valley surface so that when said hook-like segments are intertwined in an interlocked position, the valley surface of the notch in one hook-like segment contacts the valley surface of the notch in the other hook-like segment and the hook-end surface of the notch in said one hook-like segment contacts the front surface of said other hook-like segment while the hook-end surface of the notch in said other hook-like segment contacts the back surface of said one hook-like segment.

3,882,574
CLIP ON AUTO DOOR GUARD

Robert Joe Martinez, 1506 Parkside Dr., Carrolltown, Tex. 75006

Filed July 12, 1973, Ser. No. 378,519
Int. Cl. A44b *21/00;* **B60j** *11/00*
U.S. Cl. 24—73 B **1 Claim**

1. A removable and reusable auto door guard formed from suitable plastic material such as vinyl which is stretchable and has tubular end portions provided with clips formed from suitable sheet metal such as stainless steel, each clip comprising a substantially flat end portion having a plurality of teeth along both longitudinal edges thereof dimensioned so as to be inserted permanently by hand into a tubular end portion of said plastic material, said clips having a zig zag configuration providing an offset portion between two substantially flat portions, the free end of each clip being provided with a door

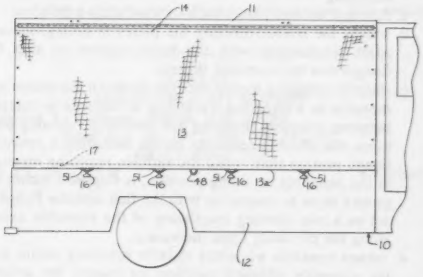


engageable portion of hook-like configuration, the length of said door guard initially being less than that of an associated door so that the plastic material of the guard must be stretched to engage the associated clip portions with lateral edges of an auto door, tension of the plastic material thus holding the guard on the door so that the guard may be easily removed only when the door is opened.

3,882,575
RELEASABLE HOLDDOWN MEANS FOR CURTAINS AND THE LIKE

John T. Jolly, 4116 Fourth Ave., Brighton, Ala. 35020

Filed June 7, 1974, Ser. No. 477,365
Int. Cl. A44b *13/00*
U.S. Cl. 24—203 **1 Claim**



1. In a holddown for securing an edge of a curtain and the like to a supporting member,

a. an elongated hollow tube-like member adapted to be carried adjacent the edge of the curtain to be secured,

b. a flexible member in the hollow tube-like member having at least one bight therein lying outside the tubular member and adapted to be placed over a hook or the like carried by the supporting member,

c. said flexible member being reeved over pulley-like members located inside the tubular mmember adjacent each end thereof and having its free ends passing through the tubular member and secured against moving into the tubular member, and

d. means resiliently mounting the pulley-like members inside the elongated hollow tube-like member for movement toward each other, said means comprising a second flexible member having a bight therein lying outside the tubular member and with its ends operatively connected to the mounting means for said pulley-like members, whereby upon increasing the length of said second named bight said pulleys move toward each other, putting slack in said first named flexible member, permitting the bight

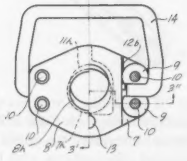
therein to be incrased in length for placing over said hook or the like.

3,882,576

HANGING STRAP FASTENER

Kyusei Kanno, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 1, 1974, Ser. No. 484,707
Claims priority, application Japan, July 13, 1973, 48-82409
Int. Cl. A44b *17/00*; **A44c** *5/18*
U.S. Cl. 24—265 R **2 Claims**



1. A fastener for attaching a hanging strap to a casing of a camera or the like, the fastener comprising

a pin attachable to the casing so that an axially extending portion of the pin projects from the casing to define an axis of rotation, said axially extending portion including first and second circular flanges that are axially spaced apart to define therebetween a circumferential groove in the pin; and

an assembly releasably attachable to the pin, the assembly including

a. first and second plates each of which has a hole,

b. means for interconnecting the plates in facing, spaced-apart relationship with the holes aligned so that the flanges can be journaled therein,

c. slidable retaining means secured between the plates and movable in a direction transverse to the axis or rotation between assembly retaining and assembly releasing positions, the slidable retaining means including a retaining flange portion that, while the slidable retaining means is in the assembly retaining position, is disposed within the groove so as to cooperate with the first circular flange to act as a stop limiting translation of the assembly axially along the pin away from the casing,

d. means operable while the slidable retaining means is in the assembly releasing position for biasing the slidable retaining means to move into the assembly retaining position, and

e. a strap ring having opposite ends each of which is held between the pair of plates.

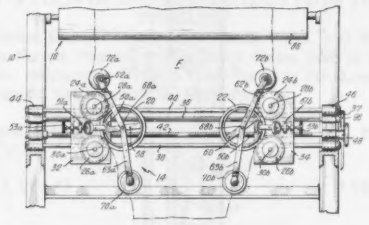
3,882,577

APPARATUS FOR TREATING TUBULAR FABRICS

Edward I. Aronoff, 605 Dorais St., Saint Laurent, Quebec, Canada

Filed Dec. 5, 1973, Ser. No. 422,011
Int. Cl. D06c *5/00*
U.S. Cl. 26—55 R **6 Claims**

1. An apparatus for handling tubular fabrics, including an upstanding frame, support means on the frame including at least a pair of opposed driven rollers spaced apart on a common plane, a pair of rings between the driven rollers in the common plane, means holding said rings in opposed relationship against said driven rollers, said holding means including running means adapted to allow the rings to rotate about their respective centers upon rotation of said driven rollers, each ring including hub means, a leading arm and a trailing arm pivoted to said hub means, said leading and trailing arms having a fixed angular relation therebetween, said arms extending from the hub and adapted to pivot in said plane relative to the center of said ring.

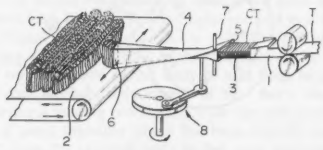


3,882,578

METHOD AND APPARATUS FOR TRANSFERRING CRIMPED TOW

Nobuharu Izawa, Ehime-ken, Japan, assignor to Teijin Ltd., Osah, Japan

Filed Sept. 4, 1973, Ser. No. 394,075
Claims priority, application Japan, Sept. 7, 1972, 47-89110; July 25, 1973, 48-83032
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 **7 Claims**



1. A method of transferring a stuffer crimped tow onto a running conveyor characterized by standing the stuffer crimped tow erect with respect to the surface of the running conveyor and traversing the tow substantially horizontally and almost perpendicular to the running direction of the conveyor and thereby arranging the tow on the conveyor in a pleated-erect pattern comprising:

crimping a tow of synthetic filaments in a stuffer crimper;

feeding the crimped tow discharged from the stuffer crimper in its as-discharged shape along a horizontal path to a chute having an entrance and an exit and a hollow passageway therebetween, said passageway having a twist of about 90° about its longitudinal axis, said chute being disposed above said running conveyor;

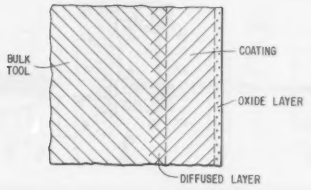
feeding the crimped tow through said passageway of said chute to thereby discharge the crimped tow from the exit of said chute perpendicularly to and onto the surface of said running conveyor and;

traversing the exit of said chute substantially horizontally and almost perpendicular to the running direction of the conveyor whereby the tow is arranged in a pleated-erect pattern on said running conveyor.

3,882,579
ANTI-WEAR THIN FILM COATINGS AND METHOD FOR MAKING SAME

Roy Norman Peacock, Lafayette, Colo., assignor to Granville-Phillips Co., Boulder, Colo.

Division of Ser. No. 234,162, March 13, 1972, abandoned. This application Aug. 21, 1973, Ser. No. 389,644
Int. Cl. B26d *1/00*; B23b *3/00*; B21k *21/00*
U.S. Cl. 29—95 R 14 Claims



7. In a tool for cutting with a tool metallic materials tending to build up on the cutting edge of said tool during a cutting operation, the improvement comprising

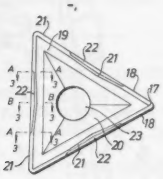
a. a cutting edge substrate;

b. a physically vapor deposited coating of a material selected from the group consisting of titanium, chromium, hafnium, zirconium, and alloys thereof with each other, the thickness of said coating being approximately in the range of 10^{-2} to 10 μm, said coating being partially diffused in said substrate to form a bond therebetween so that build up of said metallic materials on said metal containing material on said tool is minimized during said cutting.

3,882,580
CUTTING INSERT

Evert Gustav Lundgren, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Nov. 23, 1973, Ser. No. 418,219
Claims priority, application Sweden, Jan. 8, 1973, 7300187
Int. Cl. B26d *1/00*
U.S. Cl. 29—95 R 3 Claims

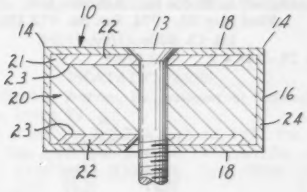


1. In a cutting insert, for chipforming machining of preferably metal work-pieces, having at least one cutting corner (17, 24) from which extends one or more cutting edges (18) provided with a chip-breaker in the form of a groove (19) alongside the cutting edge, the groove being formed in a major or chip face of the insert, only a part (13, 14) of the cutting edge, which part comprises the cutting corner and the adjacent area, normally being engaged with the work-piece (10) during the greater part of the cutting operation, the improvement wherein the insert is strengthened which improvement consists essentially in that that part of the edge which is not engaged has a smaller rake angle (top rake) γ than the part of the insert edge that is essentially active during the cutting operation and in that said rake angle γ decreases continuously along the cutting edge in the direction from the cutting corner within a significant transition range starting at a distance from the corner of one-fourth to one-third of the total length of the insert side.

3,882,581
COATED, PARTIALLY LAMINATED CARBIDE CUTTING TOOL INSERT

Charles E. Mereness, Arden Hills, and Gerald R. Abrahamson, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 13, 1974, Ser. No. 450,579
Int. Cl. B26d *1/00*
U.S. Cl. 29—95 A 12 Claims



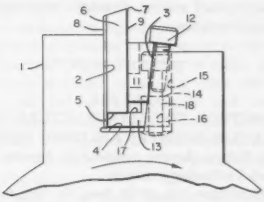
1. A laminated, crater-resistant composite metal cutting tool insert formed of sintered metal carbide comprising:

a body having a core and an edge wall shaped to define both a flank face and a cutting edge, said body having a recess filled with a lamina to define the rake face; wherein said edge wall comprises a flank wear resistant carbide material and said lamina comprises a crater-resistant material containing a majority of tungsten carbide, an iron group binder and at least one carbide of a metal from Groups IV*b* and V*b* of the periodic table, and at least the rake face and flanks of said insert are coated with a hard-surface coating having a thickness of no more than about 0.001 inch.

3,882,582
ADJUSTABLE BIT HOLDER

Thurston V. Williams, Wilton, N.H. 03086

Filed Apr. 18, 1973, Ser. No. 352,101
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 R 6 Claims



1. A tool holder for a bit with a wearing edge comprising:

a holder body having a bit recess with a bottom wall and a side wall,

a lock for laterally clamping the bit frictionally with respect to the side, the interengaging face of the bit and said recess side wall being parallel to the interengaging faces of the bit and said lock to allow sliding movement of the bit outwardly of the recess between the lock and side, and the lock including an actuator acting inwardly of the recess and comprising a wedge having an angle substantially greater than 5° and preferably 10°,

a lifter having an abutment for engaging the bit opposite the wearing edge positively to oppose movement of the bit

inwardly of the recess, and move the bit away from the bottom along the side, and

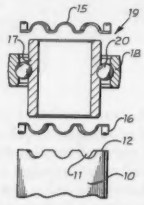
a lifter screw engaging the recess bottom and lifter, the screw being adjustable to urge the bit and wearing edge outwardly of the recess against the clamping friction of the lock, the lifter screw acting substantially in a direction opposite to the actuator so that turning the screw moves the lifter and bit in relief of the actuator force.

3,882,583

METHOD AND APPARATUS FOR ORIENTING RANDOMLY PLACED ROLLING ELEMENTS

Vic N. Thacker, and Loren H. Rasmussen, both of Kokomo, Ind., assignors to Medco Inc., Kokomo, Ind.

Filed May 22, 1974, Ser. No. 472,171
Int. Cl. B23p *11/00, 19/04*
U.S. Cl. 29—148.4 A **12 Claims**



6. A process for orienting randomly placed rolling elements comprising:

a. placing an anti-friction bearing sub-assembly with randomly spaced rolling elements in contact with a cylindrical member, said cylindrical member having at least one end spacedly notched such that said notches can receive said rolling elements; and

b. causing one of said races to move while the other is held stationary, said movement continuing until each of said randomly spaced rolling elements has been received by one of said notches.

3,882,584

METHOD FOR MANUFACTURE OF ABRASION-RESISTANT SLIDING MEMBER

Yuko Tsuya, Tokyo, Japan, assignor to Agency of Industrial Science and Technology, Japan

Filed Mar. 19, 1974, Ser. No. 452,667
Claims priority, application Japan, Mar. 23, 1973, 48-33217
Int. Cl. B21d *53/10*
U.S. Cl. 29—149.5 S **2 Claims**

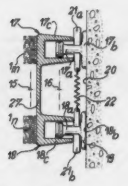
1. A method for the manufacture of an abrasion-resistant sliding member consisting essentially of the steps of forming a multiplicity of parallel holes into a metal blank through one terminal face thereof, filling the holes with a solid lubricant, scaling the terminal face so that the solid lubricant cannot substantially enude out during the subsequent elongation, and elongating the solid lubricant-containing metal block in the direction of the sand holes for thereby causing the cross section of the metal to contract simultaneously with the cross section of the lubricant-filled holes.

3,882,585

METHOD AND DEVICE FOR POSITIONING PRESTRESSING HOOPS

Didier Costes, and Jack Picaut, both of Paris, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 5, 1974, Ser. No. 440,137
Claims priority, application France, Feb. 6, 1973, 73.04168
Int. Cl. B23p *13/00, 19/00;* **B21d** *39/00*
U.S. Cl. 29—150 **11 Claims**



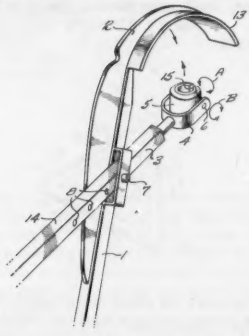
1. A method of positioning hoops of steel wire or strip for prestressing a vessel which contains an internal pressure, with interposition of bearing saddles placed at uniform intervals on the periphery of the pressure vessel, wherein a winding core is placed between the bearing saddles and the prestressing hoops and is driven in rotational motion in order to wind said hoops.

3,882,586

TOOL FOR FASTENING COMPENSATING WEIGHTS TO SPOKED WHEELS

Gunter Schmidt, Darmstadt, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany

Filed Mar. 19, 1974, Ser. No. 452,673
Claims priority, application Germany, Aug. 14, 1973, 2341116
Int. Cl. B25b *27/02*
U.S. Cl. 29—268 **7 Claims**



1. A tool for fastening compensating weights to spoked wheels comprising:

a first tong leg having an extended region for engaging the peripheral surface of a spoked wheel,

a second tong leg pivotably connected to said first leg, and a weight receiving member connected to said second leg and having a bore extending therethrough for receiving a weight compensating element, said bore being opposite said engaging region of said first tong, said member being pivoted about a first axis extending along the direction of said second leg and a second axis extending transversely to said first axis.

3,882,587
METHOD OF PRODUCING A FIBRE-REINFORCED MATERIAL

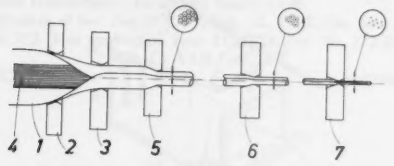
Friedrich Schneider, and Dieter Stockel, both of 7530 Pforzheim, Germany, assignors to G. Rau, Pforzheim, Germany

Filed Dec. 3, 1973, Ser. No. 421,281

Claims priority, application Germany, Dec. 6, 1972, 2259636

Int. Cl. B23p *17/04*

U.S. Cl. 29—419 R **9 Claims**



1. A method for producing a composite shaped element formed of a homogeneous matrix substance having intimately embedded therein a plurality of reinforcing fibers of a material different from that of said matrix substance and of a material capable of structurally reinforcing said matrix substance, said method consisting essentially of:

rigidly and metallurgically connecting to each of a plurality of wires of a reinforcing material a sheath of said matrix substance;

arranging said plurality of thus sheathed wires in a bundle in contact with each other;

continuously advancing said bundle of sheathed wires in a longitudinal direction;

encasing the thus advancing bundle of sheathed wires in a jacket of jacketing material;

continuously applying a lubricant to the exterior surface of said thus advancing jacket while maintaining the interior surface of said jacket and the exterior surfaces of said sheathed wires free of said lubricant and in a metallic bright condition; and

subjecting said thus lubricated advancing bundle of sheathed wires to a plastic reduction working operation, and thereby reducing the cross-sectional area of said wires to form reinforcing fibers, while mechanically bonding said sheaths into a uniform homogeneous matrix, to thus form said shaped element of homogeneous matrix substance having embedded therein said fibers, and thereby reinforcing said matrix.

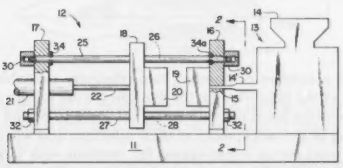
3,882,588
METHOD FOR HANDLING TIE RODS ON AN INJECTION MOLDING MACHINE

Patrick M. McFalls, Rockford, Ill.; David W. McCarty, and Robert B. Hare, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed May 14, 1973, Ser. No. 359,691

Int. Cl. B23p *19/02*

U.S. Cl. 29—427 **13 Claims**



1. A method of moving a tie rod longitudinally along its axis in an injection molding apparatus of the type including a stationary platen and a movable platen carrying mating mold halves, a stationary cylinder base plate on the side of the movable platen opposite from the stationary platen, a plurality of tie rods extending between the stationary platen and the cylinder base plate with the movable platen movably mountd on said tie rods, coupling means fixedly connecting the tie rods against movement relative to the cylinder base plate and the stationary platen, and a power means for moving the movable platen along the tie rods towards and away from the stationary platen to close and open the mold halves, comprising the steps of: securing a releasable clamp onto a tie rod adjacent the movable platen, on the side thereof facing the cylinder base plate,

disconnecting the tie rod at the stationary platen so as to permit movement of the tie rod in a direction from the stationary platen towards the cylinder base plate,

and moving the movable platen longitudinally towards the cylinder base plate to move it against the clamp to thus move the clamp which in turn moves the tie rod longitudinally with it.

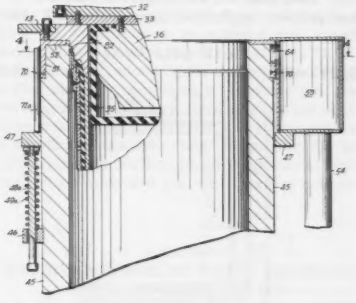
3,882,589
ISOSTATIC PRESS

Arnold G. Bowles, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Division of Ser. No. 288,703, Sept. 13, 1972, Pat. No. 3,832,103. This application June 28, 1974, Ser. No. 483,960

Int. Cl. B23p *19/00;* **B30b** *5/02, 11/02;* **B28b** *3/00*

U.S. Cl. 29—428 **2 Claims**



1. In an isostatic press including a mold with a mold plate, a pressure cylinder, a bearing plate and means for providing a seal between said mold and said pressure cylinder, the improvement in the method of sealing said pressure cylinder with respect to said mold which comprises the step of resiliently clamping said mold plate against said bearing plate before sealing said pressure cylinder with respect to said mold.

2. In an isostatic press including a mold with a mold plate, a pressure cylinder, a bearing plate and means for providing a seal between said mold and said pressure cylinder, the improvement in the method of sealing said pressure cylinder with respect to said mold which comprises:

a. lifting the mold plate upward and into engagement with said bearing plate;

b. pressing said mold plate against said bearing plate; and, then,

c. sealing said pressure cylinder with respect to said mold.

3,882,590
METHOD OF ASSEMBLING ENERGY ABSORBERS

Bernard Mazelsky, West Covina, Calif., assignor to ARA, Inc., West Covina, Calif.

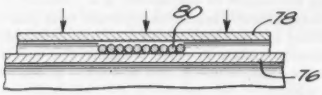
Division of Ser. No. 311,299, Dec. 1, 1972, Pat. No. 3,851,374. This application Aug. 29, 1974, Ser. No. 501,837

Int. Cl. B23p *11/02*

U.S. Cl. 29—447 **6 Claims**

1. A method of assembling energy absorbers of the type comprising cylindrical inner and outer telescoping members having circular energy absorbing means positioned in the

annular space between the members, comprising the steps of:
positioning said circular energy absorbing means on said inner telescoping member;
expanding said outer telescoping member to have an inner diameter larger than the outer diameter of said circular energy absorbing means positioned on said inner telescoping member;
positioning said expanded outer telescoping member around said circular energy absorbing means on said inner telescoping member; and



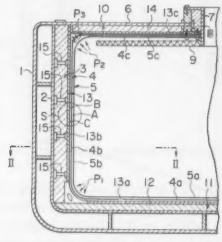
shrinking said outer telescoping member onto said circular energy absorbing means.

3,882,591

METHOD OF CONSTRUCTING A LOW TEMPERATURE LIQUEFIED GAS TANK OF A MEMBRANE TYPE

Katsuro Yamamoto, Tokyo, Japan, assignor to Bridgestone Liquefied Gas Company, Ltd., Tokyo, Japan

Filed Mar. 22, 1973, Ser. No. 343,703
Claims priority, application Japan, Mar. 27, 1972, 47-29807
Int. Cl. B21d *39/00*
U.S. Cl. 29—455 **10 Claims**



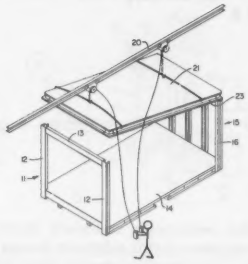
1. A method of constructing a low temperature liquefied gas tank of the membrane type, said tank comprising an other vessel of a rigid structure, a heat insulating layer provided at the inside of said outer vessel, flat side wall portions provided at the inside of said heat insulating layer and an inner membranous vessel provided further at the inside of said flat side wall portions, said inner membranous vessel being formed to have curved edge portions and at least one substantially flat seam at the flat side wall portions thereof, characterized by the steps of provisionally forming said inner membranous vessel in two parts to be connected with each other along said seam, said two parts being formed as oversized portions so that the adjacent edge portions of said two parts overlap with each other by an amount corresponding to the contraction of said inner membranous vessel at low temperature operating conditions, displacing the side wall portions of said two parts relative to each other along the surface thereof so as to eliminate the overlapping of said adjacent edge portions, said displacing being effected by provisionally shortening the radius of curvature of said curved edge portions, connecting said adjacent edge portions with each other to form said seam while keeping said side wall portions displaced, and filling up a space left between said outer vessel and said wall portions of said inner membranous vessel with a heat insulating material having compression resisting characteristics to form said heat insulating layer while still maintaining said side wall portions in a displaced state.

3,882,592

METHOD OF ASSEMBLYING A TRUCK BODY

Edward L. Mooney, and Kenneth L. Pritchard, both of Baltimore, Md., assignors to Pritchard-King, Inc., Baltimore, Md.

Filed Mar. 5, 1974, Ser. No. 448,197
Int. Cl. B23p *21/00*
U.S. Cl. 29—469 **8 Claims**



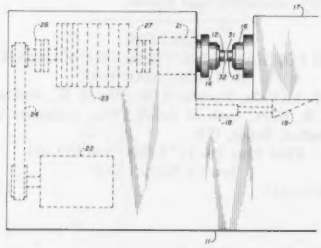
1. A method of assembling a truck body from prefabricated parts comprising the steps of
placing and attaching front wall and rear frame assemblies on an underframe assembly,
attaching a roof onto one and lowering the opposite end of the roof on the other of said front wall and rear frame assemblies,
attaching sidewall assemblies on opposite sides of said roof and mating the vertical edges of said sidewall assemblies with corner posts on said front wall and rear frame assemblies,
and attaching said sidewall assemblies to said underframe.

3,882,593

METHOD OF INERTIA WELDING

Stanley B. Lucas, Shreveport, La., assignor to E. Mickey Hubbard, Dallas, Tex. and Wilkinson, Woods, Carmody, Meadows & Hall, Shreveport, La., part interest to each

Filed Aug. 28, 1969, Ser. No. 853,840
Int. Cl. B23k *19/00*
U.S. Cl. 228—113 **8 Claims**



1. In a method of bonding two relatively rotatable workpieces, of the type wherein the workpieces are axially engaged at a common interface with sufficient force to permit friction bonding of the workpieces at their interface and wherein one of the workpieces is associated for rotation with a rotatable inertia mass and rotational energy is transferred from the rotatable mass to the one workpiece in sufficient quantity and at suitable rotational speed of the one workpiece relative to the other workpiece to effectively bond the axially engaged workpieces at their interface, the improvement comprising the sequence of applying the total axial load required to bond the

workpieces prior to initiating any relative rotation between the workpieces and then driving the workpieces in relative rotation totally by the rotatable inertia mass to produce the transfer of the rotational energy.

3,882,594

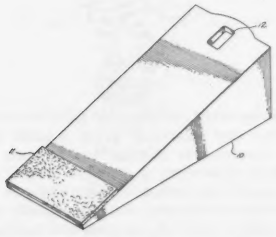
METHOD OF FORMING A HARD FACING ON THE BODY OF A TOOL

Hewy E. Jackson, Livingston, and Howard B. Myers, Humble, both of Tex., assignors to Servco Company, a division of Smith International, Inc., Long Beach, Calif.

Division of Ser. No. 227,777, Feb. 22, 1972, Pat. No. 3,790,353. This application June 21, 1973, Ser. No. 372,212

Int. Cl. B23l *31/02*

U.S. Cl. 228—122 **6 Claims**



1. A method for forming a hard facing on a less wear-resistant substrate comprising the steps of:

dispersing a plurality of particles of relatively higher density cemented metal carbide in a size range of from about 6 to 30 U.S. Sieve throughout a relatively lower density metal matrix, said particles having a sufficiently non-uniform size distribution to be present in a proportion in the range of from about 70 to 85% by volume;

freezing the metal matrix having particles of cemented carbide dispersed therein in a relatively thin large area pad having an upper surface and a lower surface;

placing the pad on a substrate with the as-frozen upper surface adjacent the substrate; and

melting the matrix metal for bonding to the substrate.

3,882,595

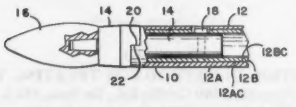
METHOD OF PRODUCING SEAMLESS TUBING

Bertrand M. Reiley, Canfield; Edwin J. Muccillo, Youngstown, and Robert G. Griffith, Poland, all of Ohio, assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Apr. 20, 1973, Ser. No. 352,928

Int. Cl. B23k *19/00;* **B21d** *39/04;* **B21b** *19/04*

U.S. Cl. 228—158 **3 Claims**



1. The method of producing seamless tubing, comprising:

a. inserting a first tube inside a second tube to form a combination;

b. heating said combination to hot working temperature;

c. stretch reducing said combination to a degree sufficient to form a laminated mandrel;

d. adding a piercer point to said laminated mandrel to form a piercer mandrel assembly;

e. rolling a billet of metal between the piercer rolls of a piercer rolling mill and causing said metal to flow about and around said piercer point supported by said mandrel and thereby form a seamless tube.

3,882,596

METHOD OF FLUX-FREE SOLDERING OF ALUMINUM-ONTAINING WORKPIECES IN A CONTROLLED ATMOSPHERE

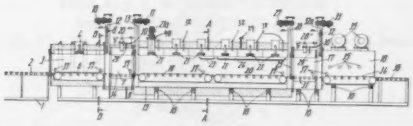
Keinz Kendziora, Bonn; Johannes Neaner, Bornheim-Merteh; Heinz Schoer, Alfter, and Werner Schultze, Bonn, all of Germany, assignors to Vereinigte Aluminium-Werke AG, Bonn, Germany

Division of Ser. No. 411,383, Oct. 31, 1973. This application Sept. 5, 1974, Ser. No. 503,242

Claims priority, application Germany, Nov. 9, 1972, 2254769

Int. Cl. B23k *31/02*

U.S. Cl. 228—200 **9 Claims**



1. In a method of flux-free soldering of aluminum-containing workpieces in a controlled atmosphere, the steps of admitting the workpieces to be soldered into a preheating chamber; preheating said workpieces to at most 500°C in said preheating chamber; admitting the thus preheated workpieces into a lock chamber containing a protective gas; admitting said workpieces from said lock chamber into a gas-tight muffle containing a controlled atmosphere, and effecting soldering in said controlled atmosphere; and discharging the soldered workpiece from said muffle through an additional lock chamber containing a protective gas, into a cooling zone or chamber.

3,882,597

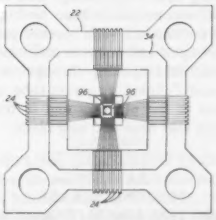
METHOD FOR MAKING A TEST PROBE FOR SEMICONDUCTOR DEVICES

George A. Chayka, Northampton; Eric J. Persson, Bethlehem, and Norbert M. Ziobro, Dupont, all of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 209,243, Dec. 17, 1971, Pat. No. 3,810,016. This application Jan. 31, 1974, Ser. No. 438,319

Int. Cl. H05k *3/00*

U.S. Cl. 29—624 **15 Claims**



5. A method of producing a test probe having a plurality of cantilevered contact elements supported on an insulator in a desired array with the ends of the elements adapted to contact individual leads of an article to be tested, comprising the steps of:

selectively removing portions of a planar conductive member to produce the contact elements, a frame portion and an expandable portion connecting the contact elements with the frame portion; and

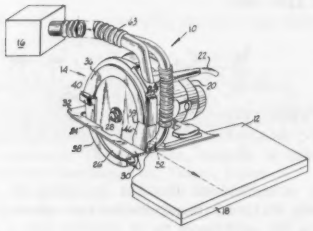
shaping the contact elements into a non-planar configuration while holding the frame portion, said shaping being facilitated by an increase in length of the expandable portion.

3,882,598

DUST CONTROL CUTTING ASSEMBLY FOR CUTTING SHEET MATERIAL

Paul Lewis Earle, Denver; Timothy Howard Seeber, Evergreen, and Milton French Trosper, Jr., Thornton, all of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed June 17, 1974, Ser. No. 479,956
Int. Cl. B27b 9/00; B27g 19/04
U.S. Cl. 30—390 **11 Claims**



1. A circular saw including a horizontally extending flat base having a front end and a back end, a circular saw blade, means for supporting said blade partially above and partially below said base in a predetermined vertical plane, means for rotating said blade in a direction which causes the outer edge of said blade to rotate up at the front end of said base and down at the back end of said base, a top blade guard fixedly located relative to and around a top outer edge portion of said blade and having a front end vertically spaced above the front end of said base, and a bottom blade guard located around a bottom outer edge portion of said blade and movable towards and around the back end of said base, the improvement comprising:

a. a shroud having a substantially U-shaped cross section and being positioned around an outer edge portion of said blade between said front end of said top blade guard and the front end of said base, said shroud having one end substantially vacuum seal connected with said front end of said top blade guard, an opposite end substantially vacuum seal connected with the front end of said base and an opening extending through said shroud; and

b. a main suction conveyance tube having one open end adapted for connection with suction producing means and the other open end vacuum seal conected with said shroud around said opening through said shroud, said other open end defining a suction tube opening located approximately in the plane of and in front of said saw blade adjacent said base and said blade.

3,882,599

PRUNING SHEARS

Raymond W. Plum, 1935 John St., Selma, Calif. 93662

Filed Dec. 19, 1973, Ser. No. 426,204
Int. Cl. B26b 13/28
U.S. Cl. 30—270 **6 Claims**

1. Improved pruning shears comprising:

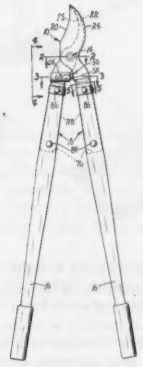
a hook blade having a pivot bore intermediate a cutting end and a handle end;

a shear blade having a pivot bore intermediate a cutting end and a handle end;

a pivot stud affixed to a first of said blades and disposed to extend through the pivot bores of each of said blades when said blades are positioned with their adjacent surfaces face to face, ensuring relationship with their pivot holes aligned;

a counterbore in said pivot bore of the other of said blades having a convex frustroconical bearing surface disposed with its smaller diameter toward said adjacent surface of said blade;

a washer having a peripheral frustroconical bearing surface mated to said frustroconical counterbore surface and an axial thickness substantially greater than the axial depth of said counterbore;



means connecting said washer to said pivot stud, said means including a center bore in said washer disposed to pass said pivot stud therethrough and having a bearing surface, a bearing surface on the periphery of said pivot stud where said pivot stud passes through said washer's center bore whereby said washer is free to move rotatably with respect to said pivot stud, and securing means interconnected with said stud adjacent said washer and disposed to hold said washer in said counterbore; and

a pair of handles each connected to the handle end of one of said blades.

3,882,600

COMPOSITION IN METHOD FOR TREATING TEETH

Richard W. Plymale, 1480 Griffin Rd., Davison, Mich. 48423

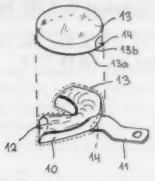
Filed Apr. 1, 1971, Ser. No. 130,438
Int. Cl. A61k 5/00
U.S. Cl. 32—15 **16 Claims**

1. A method for treating teeth or bone tissue including the step of bonding thereto a bone or dental filling composition including at least a small but effective amount of an unsaturated aliphatic addition-polymerizable organic phosphoryl monofluoride thereby to increase the bond strength of said composition to said tissue, the organic radical of said phosphoryl monofluoride containing only oxygen, hydrogen and carbon atoms.

3,882,601
INTERSTICE DEVICE FOR DENTURE DOUBLE IMPRESSIONS

Ulrich W. K. Jahn, Wehrda, Germany, assignor to Firma A. Kettenbach

Filed July 30, 1973, Ser. No. 384,100
Claims priority, application Germany, Mar. 6, 1973, 7308438
Int. Cl. A61c *9/00*
U.S. Cl. 32—17 **8 Claims**

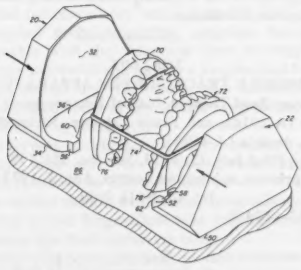


1. A method of taking dental double impressions comprising the steps of filling a dental impression tray with a primary impression material and forming said primary impression material as a mass defining an impression surface against which teeth may be pressed, covering said primary impression material by placing over said impression surface a laminar sheet of resilient strip material, forming primary dental impressions in said primary impression material by pressing teeth against said resilient strip material so that impressions are formed thereby in said primary impression material, removing said sheet material from said primary impression material, recovering said primary impression material by placing secondary impression material thereover, and forming secondary dental impressions by pressing teeth against said secondary impression material.

3,882,602
APPARATUS AND METHOD FOR MOUNTING DENTAL CASTS

Julio R. Polanco, 1 E. Harriet Ave., Palisades Park, N.J. 07650

Filed Nov. 13, 1973, Ser. No. 415,422
Int. Cl. A22c *7/00*
U.S. Cl. 32—32 **13 Claims**



1. Apparatus for use in mounting complementary maxillary and mandibular dental casts in desired occluded arrangement, said dental casts each having a planar posterior locating surface, said apparatus comprising:

a pair of shell-like bases, each having a bottom, side walls, an anterior wall and a posterior wall, all integral with the bottom and extending therefrom to establish a cavity, said posterior wall having an external planar surface, an opposite internal locator surface and a peripheral edge surface between said external and internal surfaces; and

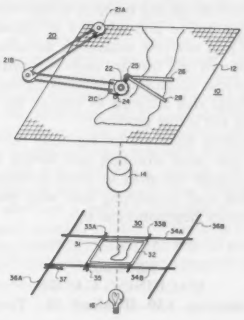
complementary interengagable means in the peripheral edge surface of each base, each said complementary means extending in a direction generally parallel to the external planar surface of each base such that upon location of each said planar surface in a common plane and interengagement of said complementary means, the pair of bases will be in a prescribed relative alignment and location;

each said internal locator surface being planar and parallel to the external planar surface of the posterior wall of the corresponding base such that the dental casts will be in said desired occluded arrangement when the bases are in said prescribed relative alignment and location.

3,882,603
SELF-CONTAINED NAVIGATION DEVICE

Maurice Distel, 38 Wyckham Rd., New Shrewsbury, N.J. 07724

Filed Aug. 2, 1974, Ser. No. 494,023
Int. Cl. G03b *21/00;* **B43l** *13/02*
U.S. Cl. 33—79 A **9 Claims**



1. A navigation device for use with a microfilm reader having a rear projection screen, said microfilm reader having movable means for mounting and projecting a portion of a microfilmed map on said rear projection screen; said navigation device comprising a parallel-linkage mechanism having one end rigid and an other end free to move with respect to said rear projection screen; a combination of special plotting arms including at least an offset arm, a primary course bearing arm, and a secondary course bearing arm; means for slidably and rotatably securing the center portion of said offset arm to said other end of said parallel-linkage mechanism; means for rotatably securing one end of said primary course bearing arm to one end of said offset arm; means for rotatably securing one end of said secondary course bearing arm to said one end of said offset arm.

3,882,604
SPLINE MEASURING UNIT

Bruce A. Macklyn, Detroit, Mich., assignor to Zero Gage Company, Detroit, Mich.

Filed Mar. 7, 1973, Ser. No. 338,958
Int. Cl. G01b *5/12*
U.S. Cl. 33—147 K **5 Claims**

1. A spline or broach diameter measuring unit adapted for insertion in the socket of a conventional dial indicator gauge holder containing a dial indicator with a reciprocable operating plunger and a reciprocable rearward motion-transmitting member operatively engageable with said plunger, said unit comprising

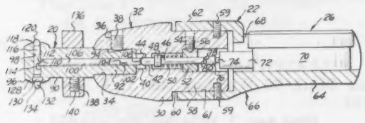
a hollow stem having a rearward portion configured to fit said socket and having a longitudinal bore therein,

a laterally-enlarged head structure on the forward end of said stem having a transverse bore therein communicating with said longitudinal bore,

a fixed measuring member stationarily mounted on said head coaxial with said transverse bore,

a movable measuring member slidably mounted in said transverse bore for motion toward and away from said fixed measuring member,

a forward motion-transmitting device slidably mounted in said longitudinal bore and adapted to operatively engage the rearward motion-transmitting member of the dial indicator gauge holder,



and motion-converting mechanism operatively connecting said movable measuring member to said forward motion-transmitting device and adapted to convert transverse motion of said movable measuring member into longitudinal motion of said forward motion-transmitting device,

said transverse measuring members having substantially hemispherical tips adapted to engage the inclined side surfaces of the spline grooves,

said measuring members having body portions disposed within said head structure and having tapered clearance portions cut away to avoid contact thereof with the spline and connecting said body portions to said substantially hemispherical tips.

3,882,605

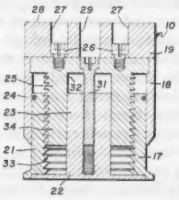
MACHINING GAUGE

George V. Lindgren, 139 Highland St., Townsend, Mass. 01469

Continuation of Ser. No. 183,165, Sept. 23, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,431

Int. Cl. G01b *5/00*

U.S. Cl. 33—170 **6 Claims**



1. A machinging gauge for setting a grinder comprising:

a. a base adapted to rest on a machine table, the base being formed of magnetizable material,

b. an upper member including an inner member adjustably engaged with the base for adjusting the total length of the base and upper member,

c. a replaceable block mounted on the upper member and having a broad, substantially uninterrupted surface to which a marking compound can be applied for the setting of the grinder,

d. means for fixing the block to the upper member said means extending upwardly from the member into the block but terminating a substantial distance from the upper surface,

e. a locking means independent of the adjusting means serving to secure the base and upper member against relative movement, and

f. a central post extending from the base and slidably engaged with a bore formed in the inner member, the locking means extending from the upper member into the upper end of the post.

3,882,606

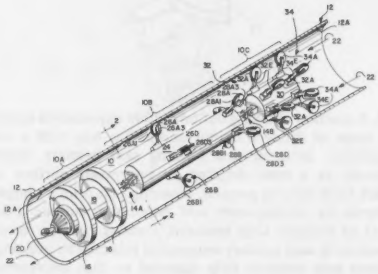
METHOD AND APPARATUS FOR MEASURING CURVATURE AND CURVATURE VARIATIONS IN PIPELINES AND THE LIKE

Reginald A. Kaenel, Weston, Conn., and Alfred E. Crouch, Friendswood, Tex., assignors to AMF Incorporated, White Plains, N.Y.

Filed May 16, 1973, Ser. No. 360,899

Int. Cl. G01b *7/28*

U.S. Cl. 33—174 L **78 Claims**



62. Transducer means for generating and retaining data representative of the curvature of a pipe section on a given cross-sectional diameter thereof comprising:

first and second distance sensing means positioned at the inner wall of said pipe section at opposite ends of said given diameter;

means for moving said distance sensing means through said pipe section to cause said distance sensing means to traverse said inner wall in a plane defined by said given diameter and the longitudinal axis of said pipe section;

encoder means for generating data representative of the distance travelled by each said distance sensing means along a predetermined finite length of said pipe section; and

recording means for receiving and retaining said data for subsequent calculation.

3,882,607

MOBILE TRACK SURVEY APPARATUS

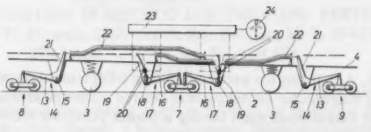
Erna Plasser; Josef Theurer, both of Johannesgasse 3, Vienna, Austria (A-101d), and Franz Egleseer, Kleinreith Nr. 32, Vienna, Austria (A-4694)

Filed July 23, 1973, Ser. No. 381,499

Claims priority, application Austria, Aug. 3, 1972, 6693/72

Int. Cl. B61k *9/00*

U.S. Cl. 33—174 R **7 Claims**



1. In mobile apparatus for surveying the vertical position or warpage of the rails of a track whereon the apparatus is adapted to run, comprising a frame, undercarriages supporting the frame for movement on the track, three rail sensing means for each of the rails, the rail sensing means being

spaced apart in the direction of track elongation and being vertically movably mounted on, and in respect of, the frame for surveying the rails, transducer means for converting any relative movement of the rail sensing means in respect of each other into an electrical error signal proportional to the relative movement, and recording means connected to the transducer means for indicating the error signals, the improvement of

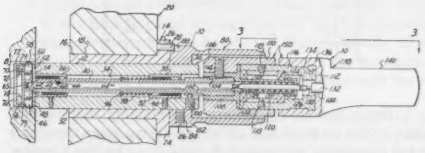
1. the transducer means consisting of two transducers,
2. means operatively connecting the two transducers to one of the rail sensing means for movement therewith,
3. two connecting elements each having a first end connected to a respective one of the transducer connecting means and a second end connected to a respective one of the two rail sensing means other than said one rail sensing means,
   a. the connecting elements operatively connecting each of the transducers to the respective other rail sensing means for movement therewith, and
4. two motion transmitting elements mounted on the frame and extending oppositely in the direction of track elongation,
   a. connected at one end to a respective transducer connecting means and connected at the other end to said rail sensing means.

3,882,608

DIFFERENTIAL-PROBE HOLE-LOCATION OR CONCENTRICITY GAUGE

Bruce A. Macklyn, Detroit, Mich., assignor to Zero Gage Company, Detroit, Mich.

Filed Jan. 16, 1974, Ser. No. 433,718
Int. Cl. G01b *5/25*
U.S. Cl. 33—174 Q **10 Claims**



1. A differential-probe hole-location gauge adapted to be rotatably mounted in a reference bore of a master fixture to activate the plunger of a conventional dial indicator for measuring the location or concentricity of a workpiece bore relatively to said reference bore, said gauge comprising

an elongated probe-supporting structure having means engageable with the reference bore for aligning said structure therewith and having a longitudinal bore therethrough and having a forward portion containing a probe bore disposed transversely to said longitudinal bore and communicating therewith,

first and second workkpiece bore probes slidably mounted in said probe bore for transverse differential motion therein relatively to one another,

first and second motion-transmitting members reciprocably mounted in said longitudinal bore with forward portions extending into said transverse bore,

a first tranverse-to-longitudinal motion-converting device disposed between said first probe and said forward portion of said first motion-transmitting member,

a second transverse-to-longitudinal motion-converting device disposed between said second probe and said forward portion of said second motion-transmitting member,

a dial indicator holder and a coupling structure connected to one another and also connected to one of said motion-transmitting members for travel unitarily therewith,

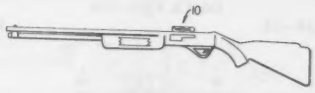
and means adapted to operatively connect the other of said motion-transmitting members to the plunger of the dial indicator to indicate relative displacement between said first and second motion-transmitting members.

3,882,609

TELESCOPIC SIGHT MOUNTING MEANS

James D. Troutman, Rt. No. 2, Keyser, W. Va. 26726

Filed July 23, 1973, Ser. No. 381,591
Int. Cl. F41g *1/38*
U.S. Cl. 33—260 **3 Claims**



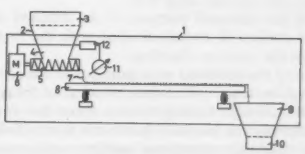
1. A mounting for telescopic sights for use with a firearm comprising an elongated base member having top and bottom surfaces, a channel extending longitudinally in the bottom surface thereof adapted to receive a conventional mounting block of a firearm, a first pair of ears extending vertically from the top surface of said base member at its one end, a second pair of ears extending vertically from the top surface of said base member at its other end, a support member adapted to receive a telescopic sight, said support being pivotally mounted on a pin extending between said first pair of ears, a pair of vertical tabs extending from the upper surface of said base member, rotatable cam means journaled on a pin extending between said vertical tabs, said rotatable cam means comprising a hub, means to rotate said hub, a plurality of cams mounted on said hub and being spaced circumferentially about the surface of the hub, each cam being adjustable to project from said hub a variable distance to engage and to pivot the support member relative to the base member, and a screw extending between said second pair of ears for drawing said ears toward each other to grip the support member when positioned therebetween.

3,882,610

FREEZE-DRYING PROCESS AND APPARATUS

Jean-Pierre Bouldoires, La Tour-De-Peilz, and Jacques Bally, Savigny, both of Switzerland, assignors to Societe d'Assistance Technique Pour Produits, Nestle S.A., Lausanne, Switzerland

Filed Jan. 28, 1974, Ser. No. 436,959
Claims priority, application Switzerland, Feb. 5, 1973, 1591/73
Int. Cl. F26b *5/06*
U.S. Cl. 34—5 **7 Claims**



1. In a freeze-drying process, comprising continuously feeding frozen product into a freeze-drying chamber and withdrawing dried product therefrom, the improvement which comprises measuring the pressure within the chamber at at least one point therein, and continuously adjusting the rate of feed of frozen product into the chamber to maintain the measured pressure substantially constant.

4. A freeze-drying apparatus, comprising means for continuously feeding frozen product into a drying chamber, and means for measuring the pressure at at least one point within the chamber, there further being means for controlling the feed rate of the feeding means as a function of the pressure,

the controlling means being electrically connected between the pressure measuring means and the feeding means.

3,882,611

DRYER FOR FORAGE AND LIKE MATERIALS AND METHOD

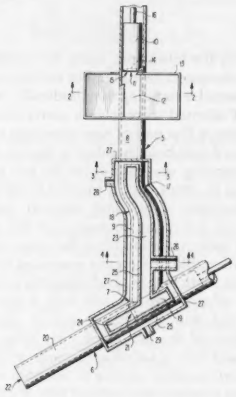
Roy Donald Eykamp, Medway, Quirindi, New South Wales, Australia (2343)

Filed Jan. 3, 1974, Ser. No. 430,551

Claims priority, application Australia, Jan. 5, 1973, 1816/73

Int. Cl. F26b *5/04*

U.S. Cl. 34—15 **10 Claims**



1. A method of drying forage comprising the steps of:

depositing forage to be dried into a first conduit,

compressing the forage in the first conduit to form a compacted mass of forage in substantial fluid-tight sealing relation about the first conduit,

advancing the compacted mass along the first conduit into a vacuum chamber,

diffusing the compacted mass in the vacuum chamber,

introducing a sub-atmospheric pressure in the vacuum chamber,

advancing the diffused mass along the vacuum chamber,

repeatedly removing portions of the diffused mass from the leading end thereof as the diffused mass advances through the vacuum chamber,

delivering the removed portions of the diffused mass to a second conduit in communication with the first conduit through the vacuum chamber,

compressing the removed mass portions in the second conduit to form a second compacted mass of forage in substantial fluid-tight sealing relation about the second conduit whereby the vacuum chamber is substantially sealed by the fluid-tight substantial sealing engagement of the first and second compacted masses in their respective first and second conduits, and

advancing the second compacted mass along the second conduit to a discharge remote from the vacuum chamber.

4. Forage drying apparatus comprising:

a first tubular conduit including an upstream compacting tube and a down stream vacuum chamber, the lateral cross-sectional area of said vacuum chamber being greater than the cross-sectional area of said compacting tube,

a second tubular conduit coupled to said first conduit and in communication with the downstream end of said vacuum chamber,

said second conduit having a discharge,

means for feeding forage to be dried into said compacting tube,

means carried by said first conduit for compacting forage in said compacting tube thereby to seal said first conduit with the compacted forage and for advancing the compacted forage into and through said vacuum chamber,

means carried by said second conduit for recompacting the forage received therein from the vacuum chamber thereby to seal said second conduit with the recompacted forage and for advancing such forage toward said discharge, and

means for establishing and maintaining a sub-atmospheric pressure in said vacuum chamber between the seals formed in the first and second conduits.

3,882,612

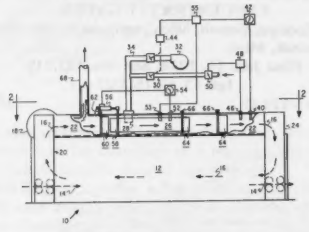
METHOD AND APPARATUS FOR LIMITING THE CONCENTRATION OF COMBUSTIBLE VOLATILES IN DRYER EMISSIONS

Robert W. Try, Tigard, and David W. Campbell, Tualatin, both of Oreg., assignors to Moore Dry Kiln Company of Oregon, Portland, Oreg.

Filed July 27, 1973, Ser. No. 383,401

Int. Cl. F26b *3/02*

U.S. Cl. 34—27 **17 Claims**



1. A dryer for drying materials containing combustible volatiles by the recirculation of heated drying gases through a chamber containing said materials, said dryer having a system for both heating said drying gases to a predetermined operating temperature range suitable for drying said materials and simultaneously incinerating a portion of said combustible volatiles drawn from said materials during drying so as to limit the concentration of said volatiles in the stack gases emitted from said dryer, said dryer comprising:

a. heater duct means for accepting a portion, less than all, of said drying gases from said drying chamber after said gases have been passed over said materials, said heater duct including means for heating said portion of said gases at least to a predetermined minimum required combustion temperature of said volatiles, said combustion temperature being substantially greater than said predetermined operating temperature range, and further including means for supplying at least the majority of the heat requirement of all of said drying gases;

b. bypass duct means for accepting a separate portion of said drying gases from said drying chamber;

c. means for intermixing said respective portions of said drying gases emitted from said respective duct means and for conducting the resultant mixture of said drying gases through said drying chamber for passage over said materials;

d. means automatically responsive to the temperature of said resultant mixture of drying gases for modulating the heat output from said heating means so as to maintain the temperature of said resultant mixture within said predetermined operating temperature range; and

e. variable gas flow modulating means automatically responsive to the temperature of said gases within said

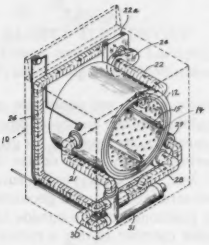
heater duct means for decreasing the volumetric flow rate of said portion of said gases passing through said heater duct means whenever the temperature of said gases within said heater duct means falls below said predetermined minimum required combustion temperature of said volatiles.

3,882,613

CLOTHES DRYER

Joseph M. Wilson, 133 Cornwall St., Salinas, Calif. 93901

Filed May 20, 1974, Ser. No. 471,503
Int. Cl. F23b *19/00*
U.S. Cl. 34—48 4 Claims



1. A clothes dryer having a drying system that includes, in combination,

a. a heat generating chamber having heat generating means therein;

b. a clothes tumbling and drying chamber;

c. a first conduit running from the heat generating chamber to the tumbling and drying chamber and communicating exclusively with said chamber so that essentially all gaseous drying medium introduced through the heat generating chamber is required to pass to and through the tumbling and drying chamber;

d. a second conduit means connected to conduct the gaseous drying medium from the tumbling and drying chamber to a reheating chamber which surrounds the heat generating chamber in intimate heat exchanging relation therewith;

e. a third conduit means connected to deliver the drying medium from the reheating chamber to a neutral chamber having discharge openings, one from which it may be discharged to the atmosphere, and the other connected to said heat generating chamber so that part of said drying medium may be returned for recirculation through the heat generating chamber;

f. drying medium impelling means in certain of said conduits for causing the drying medium to progress as described;

g. thermostatic switch means associated with the tumbling and drying chamber and responsive to the temperature thereof; and

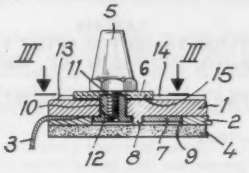
h. means responsive to said thermostatic switch means for activating the heat generating means and causing drying medium to be freshly introduced from the heat generating chamber for transmittal in its entirety to and through the tumbling and drying chamber so long as the temperature in the tumbling and drying chamber has not attained a predetermined maximum value, but effective upon the attainment of such maximum value to cut off the furnishing of fresh drying medium through the heat generating chamber and to suspend the generation of heat in said chamber, with the consequence that drying medium already in the system at such cut-off is caused to recirculate through said chambers, including particularly the heat generating chamber, until the temperature in the tumbling and drying chamber has fallen to a predetermined minimum, at which point the thermostatic means reinstitutes the generation of heat in the heat generating chamber and the delivery of fresh drying medium therefrom.

3,882,614

STUDDED OR SPIKED SPORTS SHOES

Pierre Albaladejo, Bois de Boulogne, 40100 Dax, France

Filed Apr. 9, 1973, Ser. No. 348,991
Claims priority, application France, Apr. 24, 1972, 72.14525
Int. Cl. A43c *15/00*
U.S. Cl. 36—67 D 10 Claims



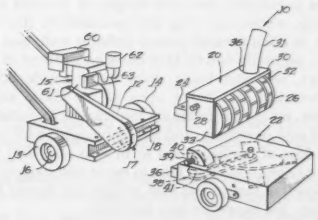
1. A sports shoe including a sole having a plurality of projections mounted thereon; and means in said sole for mounting at least one of said projections on the sole separately and independently of the remainder of said projections, said mounting means including means for adjusting the longitudinal position of said at least one projection independently with respect to the remainder of the projections; and means cooperating with said one projection for locking said projection in its adjusted position against movement during use of the shoe by the wearer.

3,882,615

COMBINED SNOW-MOWER

Larry W. Williams, 4507 S. Woodward, Downers Grove, Ill. 60515

Filed June 12, 1973, Ser. No. 369,288
Int. Cl. E01h *5/09*
U.S. Cl. 37—43 L 3 Claims



1. An apparatus comprising in combination:

a wheeled power housing including a pair of spaced apart wheel means supported at the ends of axle shaft members secured to and extending from said wheeled power housing, an engine mounted to the upper portion of said housing, said engine having a drive shaft extending horizontally therefrom, a drive coupling member extending from the engine, said drive coupling member including a shielded passage, a power train means connected between the drive shaft of said engine and an output end of said drive coupling member, said output end including a splined gear, a channel formed in said wheeled power housing and positioned within the said housing so as to be in accessible registry with said drive coupling member; and

an adapter unit to be secured to said wheeled power housing by means secured to said channel formed in said wheeled power housing, and driven therefrom by coupling with

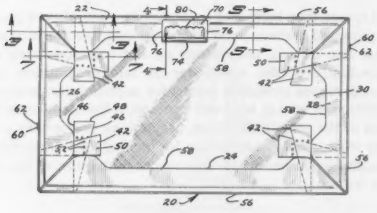
said drive coupling member, said adapter unit including an elongated channel engaging strip means which extends from side to side of the adapter unit an extent corresponding substantially to the spacing between said wheel means, a working member associated with said adapter unit including a splined shaft arranged for engagement with a splined gear at the output end of said drive coupling member when said adapter unit is inserted into said channel formed in said wheeled power housing thereby drivingly connecting said adapter unit to said wheeled power housing.

3,882,616

STRETCHER FRAME FOR ARTIST'S CANVAS

Eugene J. Starzyk, 3901 Polk St. N.E., Minneapolis, Minn. 55421

Filed July 31, 1974, Ser. No. 493,241
Int. Cl. D06c *3/08*
U.S. Cl. 38—102.1 **8 Claims**



1. In combination with an artist's canvas, a stretcher frame for stretching said canvas, said frame having four elongated stretchers, two each being the same length, and each having a tongue and a groove at each end of configuration to fit together tongue and groove with said adjacent stretchers to form a flat, rectangular structure adapted to receive said canvas, each of said grooves when assembled with one of said tongues continuing past said tongue to provide an inwardly diverging, wedge-receiving slot bounded by the end of said tongue, two flat parallel groove-defining walls and a camming surface, said walls and surface being constituted as part of said stretcher, said slot being open to an inside edge of said stretcher, said slot being open to an inside edge of said stretcher, means for fastening said canvas to outside edges of each of said stretchers, and in combination with substantially flat wedges of configuration to fit into said slots and having edges of configuration to tend to move said tongues away from said camming surfaces as said wedges are forced farther into said slots; the improvements including:

A. constituting each of the stretchers and each of the wedges of suitable plastic material;

B. at least one substantially flat surface of each of said wedges being provided with a plurality of spaced-apart, upstanding bumps thereon, the overall thickness of said bumps and of each of said wedges being sufficiently greater than the transverse dimension between the two groove-defining walls of its associated slot so that the wedge will be retained in place by said walls as it is and after it has been forced into said slot to achieve the tensioning of said canvas; and

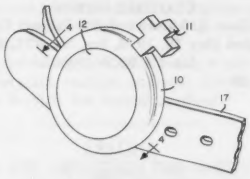
C. the dimensioning of the wedges and bumps and of the groove-defining walls of the slots and the physical properties of the plastic of the stretchers and of the plastic of the wedges being such that the slot walls and bumps will deform when said wedges are forced into said slots and will completely regain their original shape and dimensions shortly after said wedges are removed from said slots.

3,882,617

BELT BUCKLE

Joseph L. Gagner, P.O. Box 1406, 110 N. Santa Cruz Ave., Los Gatos, Calif. 95030

Filed Mar. 25, 1974, Ser. No. 454,688
Int. Cl. G09f *3/14*
U.S. Cl. 40—21 C **4 Claims**



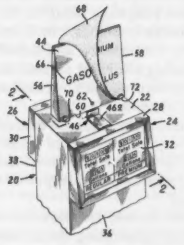
1. A belt buckle having an adjustable member with an indicator attached thereto, the combination comprising a base member having means on its backside for gripping a belt, said base member having a cavity in the center thereof extending away from said belt, said cavity being surrounded by wall structure of predetermined external geometric shape, an adjustable member positioned on the outside of said base member, said adjustable member having a recess facing said base member, said recess being of said predetermined geometric shape for receiving said wall structure, a front member having a stud attached thereto, a portion of said stud extending into said cavity, means attached to said stud for engaging said adjustable member so that the recess of said adjustable member is dislodged from said wall structure when pressure is applied to said stud and said adjustable member is free to rotate to position the indicator thereof in any one of a plurality of predetermined positions.

3,882,618

ADVERTISING AND DISPLAY DEVICE

William S. Hart, 22 Suttonwood Dr., Commack, N.Y. 11725

Filed Sept. 17, 1973, Ser. No. 397,825
Int. Cl. G09f *07/00*
U.S. Cl. 40—125 H **5 Claims**



1. Apparatus for supporting an advertising or display sign or the like atop a gasoline pump having a substantially flat top surface and a pair of oppositely disposed vertical side surfaces, each of said side surfaces including a window assembly releasably secured thereto, said window assembly having a window portion retained within a frame, the frame adapted to bear against the pump side surface and maintain the window portion spaced therefrom when said window assembly is secured in place on said pump, said supporting apparatus comprising, mounting means for retaining said display device in an upright position when said supporting apparatus is positioned on the pump,

a pair of rigid elongated members extending from opposite sides of said mounting means, said members adapted to rest on the top surface of said pump and maintain said mounting means in position to retain said display device in its upright position,

and leg means at the free ends of each of said elongated members extending downwardly from said top surface when said members rest on said top surface, said leg means being shaped and dimensioned to be firmly retained between said pump and the frames of said window assemblies when said window assemblies are attached to their respective side surfaces, whereby said supporting apparatus is locked against movement relative to said pump.

3,882,619

SAMPLE TUBE DEVICE

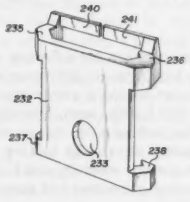
Pierre Durand, Fresnes, and Gerard Lartigue, Fontenay-aux-Roses, both of France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 263,537, June 16, 1972, abandoned. This application June 20, 1974, Ser. No. 481,264

Claims priority, application France, June 24, 1971, 71.23072

Int. Cl. G09f *3/20*

U.S. Cl. 40—310 **4 Claims**



1. Apparatus for use in machine automated analysis of samples such as blood and with which there is associated an information-carrying member and a tube containing the sample to be analyzed, comprising

a main body defining a receptacle for a tube containing the sample to be analyzed,

a panel unitarily provided on said body, said panel having a plane surface and projecting longitudinal edges of predetermined shape,

a clip member detachably securable to said panel and including a plate portion having cooperating shape with said panel for enabling an information-carrying member to be kept between said plane surface of said panel and said plate,

a plurality of resilient grasping lugs provided on the periphery of said plate portion, said grasping lugs being adapted to engage with said longitudinal edges, and

a pair of resilient tongues extending from the uppermost pair of grasping lugs substantially parallel to the plane defined by said plate portion, said resilient tongues being arranged to bear upon the said tube when housed in said receptacle.

3,882,620

APPARATUS AND METHOD FOR PRESENTATION OF READING MATERIALS

Paul D. Grindle, 2225 Mass. Ave., Cambridge, Mass. 02140

Filed May 2, 1973, Ser. No. 356,412

Int. Cl. G09f *11/28*

U.S. Cl. 40—343 **5 Claims**

1. An apparatus for presenting reading material in the form of a plurality of pages to be read by direct viewing under ambient light, comprising:

a. a single sheet having all the pages of said material to be read printed thereon in a predetermined order;

b. index marks disposed on said sheet for indicating the position of each of said pages;

c. enclosure means for enclosing said single sheet, said enclosure means defining an aperture large enough for a portion of said sheet corresponding to at least one page of said reading material to be displayed for reading;

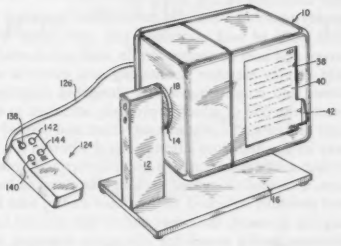
d. feed spool means for supporting said single sheet in roll form within said enclosure;

e. means for guiding said sheet along a path extending from said feed spool means, said path lying subadjacent said aperture;

f. take-up spool means for taking up said sheet from the guide means and unwinding said sheet from said support means by advancing said sheet along said path past said aperture whereby successive pages of said reading material are displayed through said aperture in said predetermined order;

g. motor means having a source of power;

h. transmission means having first and second modes for coupling said motor alternately to either said feed spool means or said take-up spool means, respectively, said transmission means comprising:



I. a first gear mounted for rotation with said feed spool;

II. a second gear mounted for rotation with said take-up spool;

III. plate means pivotally mounted in said enclosure;

IV. gear means mounted on said plate means for coupling power from said motor to either said first gear in said first mode when said plate is in a first position or said second gear in said second mode when said plate is in a second position;

V. a spring for urging said plate into one of said positions; and

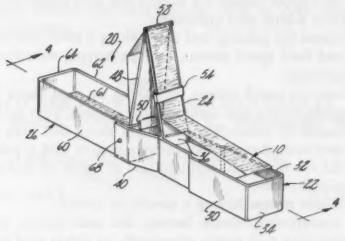
VI. a solenoid for urging the plate into the other position in response to said control means;

i. remote switch means adapted to be actuated into a plurality of switch configurations by a handicapped person from a location which is remote from said enclosure means;

j. means for detecting said index marks; and

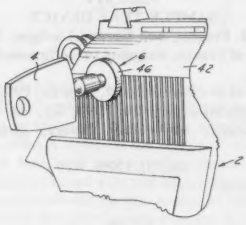
k. control means responsive to said remote switch means and said means for detecting said index marks on each of said pages for controlling said motor means and said transmission means in response to said remote switch means to cause the selective unwinding and winding of said sheet and the successive display of each of said pages.

3,882,621
DISPLAY DEVICE
Clement Farber, 16300 W. Nine Mile Rd., Apt. 710, Southfield, Mich. 48075
Filed Sept. 10, 1973, Ser. No. 395,852
Int. Cl. B41j *11/58*
U.S. Cl. 40—352 **2 Claims**



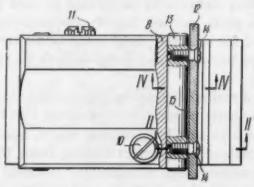
1. A display device for facilitating the reading of an elongated recording member comprising:
an elongated rectangular container;
a rectangularly shaped cover for enclosing said container, said container and said cover being positionable in an end-to-end fashion with the interiors of said cover and said container facing upwardly;
a display member vertically positionable between the adjacent ends of said container and said cover when said cover and said container are in said end-to-end fashion, said display member connecting said cover to said container and comprising a first elongated rectangular element, one end of which is pivotally attached to said adjacent end of said container such that said display member may be pivoted from a first position wherein it is disposed within said container to a second vertically raised position, a second elongated rectangular element having one end pivotally attached to the other end of said first rectangular element, the other end of said second retangular element having means for releasably engaging said adjacent end of said cover to support said display member in said vertically raised position;
an elongated foldable recording member;
means carried by said display member for holding a portion of said recording member thereon to facilitate the reading of said portion of said recording member and to facilitate the selective hand movement of said recording member from said container to said cover for storage therewithin, said last mentioned means comprising a securing element slidably carried along the length of said first rectangular element for securing said recording member to said first rectangular element such that said recording member may be slidably moved across the exposed face of said first rectangular element, said securing element being fabricated from a transparent material to permit viewing and magnification of said recording member thereunder; and
means carried by said container for releasably engaging said adjacent end of said cover and to secure said container and said cover in said end-to-end fashion, said releasable engaging means comprises a pair of laterally disposed flaps with one end of each said flap being pivotally attached along the vertically opposed corners of said adjacent end of said container, and the opposite end of each said flap having an aperture which cooperates with a projection on the vertically opposed sides of the said cover;
said adjacent end of said container having a reduced cross-section so as to define recesses on the opposite sides of said container which are adapted to receive said flaps and which results in a uniformly shaped container, said cover being adapted to enclose the interior of said container when said flaps are received in said reduced cross-sectioned recesses, respectively, and the display and recording members are located within the container, so as to form a self-contained box-like enclosure.

3,882,622
LOCKING MEANS FOR FIREARMS
George T. Perlotto, 22630 Overlake Ave., St. Clair Shores, Mich. 48080
Filed July 16, 1973, Ser. No. 379,811
Int. Cl. F41c *17/08*
U.S. Cl. 42—1 LP **4 Claims**



1. A locking mechanism for a firearm comprising a safety lever, means for locking said safety lever with a key operable lock, a locking cam having a cam surface, a proper key to rotate said lock and locking cam, a locking plunger whereby movement of the locking cam moves said locking plunger releasing said safety lever, said locking cam having a key operable lock at one end whereby said locking cam is rotated when the proper key is inserted and turned.

3,882,623
SIGHTING DEVICE FOR SPORTING FIREARMS
Efim Leontievich Khaidurov, ulitsa Glagoleva, 25, korpus 2, kv. 138, Moscow, and Vladimir Alexandrovich Razorenov, ulitsa Ponomareva, 4a, kv. 51, Minsk, both of U.S.S.R.
Filed Jan. 30, 1974, Ser. No. 437,955
Int. Cl. F41g *1/16*
U.S. Cl. 42—1 S **1 Claim**

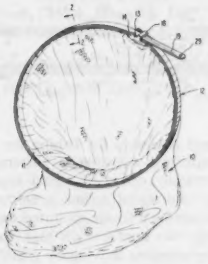


1. A sighting device for a sporting firearm, comprising: a base; a housing mounted on said base for adjustment-wise rotation and reciprocation relative thereto at ranging of said firearm; a backsight adjoining an end face of said housing; a through opening made in said housing adjacent to said end face thereof; a through slot made in said housing, adjoining said opening along the generatrix surface of said opening; a pin accommodated in said opening; screw means adapted to urge said pin and said backsight against said housing, passing through said slot toward said pin, whereby said backsight may be adjusted jointly with said pin relative to said housing within a broad range at ranging of said firearm.

3,882,624
BAIT NET

William D. Pityo, St. Petersburg, Fla., assignor to Reel Power Equipment, Inc., St. Petersburg, Fla.

Filed Oct. 29, 1973, Ser. No. 410,357
Int. Cl. A01k 77/00
U.S. Cl. 43—12 2 Claims



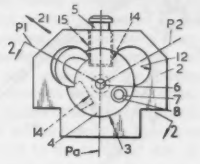
1. A bait net comprising a net body having an expansible and contractable mouth and having a tubular hem portion adjacent said mouth, and expansible and contractable frame for the bait net consisting of a unitary elongated thin strip of uniform cross section and formed of resilient material, said tubular hem portion being adapted to receive said frame therethrough loosely and movably, a guiding and locking unit for said expansible and contractable frame including a rigid body having a relatively narrow slot formed therethrough from end-to-end, said slot conforming substantially to the cross sectional shape of said strip so that the opposite ends of the strip may enter the slot in generally close fitting relation therewith, said rigid body having a relatively deep channel passage formed therethrough from end-to-end outwardly of said slot in relation to said frame and tubular hem, said channel passage being deep enough to receive plural convolutions of said strip therein in radially superposed relation and said channel passage being of a width to prevent appreciable edgewise displacement of said convolutions, said slot and channel passage being parallel and extending generally circumferentially of the net mouth and said frame, a transverse retainer bar on said rigid body spanning the outer open side of said channel passage and serving to retain said plural convolutions therein while allowing them to slide lengthwise in the channel passage, the opposite ends of said strip being apertured, a longitudinal leaf spring element on the interior side of said rigid body remote from the channel passage, an anchoring screw for said leaf spring element engaged threadably in said rigid body and extending through the aperture near one end of said strip for locking said one end in said relatively narrow slot, and a locking pin element on the leaf spring element spaced from said screw and received by an opening in the interior side of the rigid body and adapted to enter the aperture near the other end of said strip when the other end is engaged in said slot to releasably lock the other end in said slot when said bait net is in a fully expanded condition.

3,882,625
BREECH MECHANISM FOR GUNS

Paul Emile Francois Tellie, 20, rue, Bergson, 42000 Saint Entenne, France

Filed Jan. 23, 1974, Ser. No. 435,994
Claims priority, application France, Jan. 29, 1973, 73.02966
Int. Cl. F41c 15/00
U.S. Cl. 42—25 11 Claims

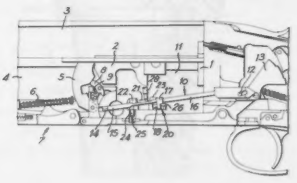
1. A breech mechanism adapted for mounting in a gun and comprising; an extractor which is engageable with an ammunition casing to effect withdrawal of the casing and to effect ejection of the casing laterally of the gun when the breech mechanism is mounted in the gun; and housing means provided by the mechanism to form a pair of locations for the extractor, the extractor being positionable in a selected location of said pair of locations, and one of said locations providing for ejection of a casing to one side of the mechanism when the extractor is positioned in said one location and the other of said location providing for ejection of casing to the other side of the mechanism when the extractor is positioned in said other location.



3,882,626
EJECTION SELECTOR FOR HINGED FIREARMS

Ernest Henri Vervier, Oupeve, Belgium, assignor to Fabrique Nationale Herstal S.A., Herstal-lez-Liege, Belgium

Filed June 12, 1973, Ser. No. 369,291
Claims priority, application Belgium, July 11, 1972, 52037
Int. Cl. F41c 15/04
U.S. Cl. 42—47 4 Claims



1. In a hinged firearm having a hinge action, an ejector normally operable when the firearm is broken, an ejector control means, an ejector pushrod traversing the firearm hinge action and normally engaging the ejector control means when the firearm is broken, and an actuator for said pushrod; the improvement comprising an ejector pushrod formed at least in two pieces, the total length of said pieces when juxtaposed end to end being such that said pushrod is incapabble of engaging said ejector control means when said pushrod is axially displaced by said actuator when the forearm is broken; and a movable ejector selector means for selectively positively spreading said pushrod pieces apart for extending the effective length of said pushrod sufficiently to enable said pushrod to engage said ejector control means when the pushrod is axially displaced by said actuator when the firearm is broken.

3,882,627
DRAGNET FOLDING DEVICE

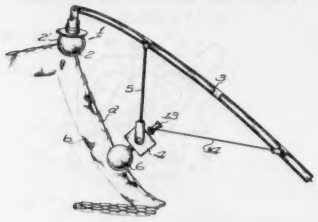
Daigo Takamura, 73, Azatateshita, Iwaki, Japan

Filed July 27, 1973, Ser. No. 383,136
Int. Cl. A01k 73/12
U.S. Cl. 43—8 2 Claims

1. A device for folding a dragnet on a deck, which comprises;

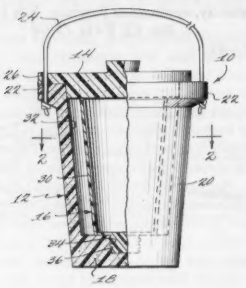
a pair of spherical ball rotors, each of which has an outer surface of elastic rubber and each of which is elastically pressed towards the other so as to frictionally engage a drag rope introduced between said rotors;

a reciprocatable housing supporting said pair of rotors and enclosing means for rotating each of said spherical ball rotors in directions opposite to each other; and



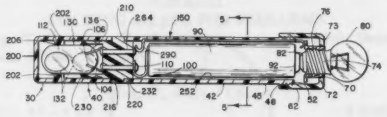
means for reciprocating said housing above said deck.

3,882,628
BAIT BUCKET ASSEMBLY
Virgil E. Stouder, 313 N. 18th St., Independence, Kans. 67301
Filed Jan. 12, 1973, Ser. No. 323,311
Int. Cl. A01k *97/04*
U.S. Cl. 43—55 **3 Claims**



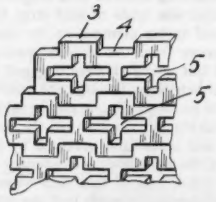
1. In a bait bucket assembly of the type including a container molded of foamed plastic having a bottom wall and peripheral wall means extending upwardly from the periphery of said bottom wall and lid means molded of foamed plastic movable between opened and closed relation with said container so as to define an accessible insulated interior chamber therein, the improvement which comprises in combination therewith, said bottom wall having interior surface means formed in the central portion thereof and provided with a plastic annular insert having a threaded configuration secured within an annular recess formed in the bottom wall of said container and spaced inwardly from a juncture of said peripheral wall means therewith, and a bait receptacle having a bottom wall and a peripheral wall means extending upwardly from the periphery thereof, the bottom portion of said bait receptacle having exterior surface means of threaded configuration complementary with said interior surface means for detachable threaded engagement therewith to fixedly secure said bait receptacle within said chamber in an operative position therein wherein the peripheral wall means thereof extends upwardly from the bottom wall of said container in annularly spaced relation with the peripheral wall means thereof, the exterior size of said bait receptacle being substantially less than the interior size of said chamber so as to provide a substantial space within said chamber exteriorly of the peripheral wall means of said bait receptacle for the support of a solid cooling agent therein capable of maintaining bait and the like disposed within said bait receptacle in a fresh condition for an extended period of time.

3,882,629
FISHING ROD SIGNAL LIGHT
John A. Kaye, 4363 S. 42nd St., Omaha, Nebr.
Filed Oct. 9, 1973, Ser. No. 404,240
Int. Cl. A01k *97/12*
U.S. Cl. 43—17 **13 Claims**



1. A bite signal assembly for fishing for attachment to a fishing rod comprising: a casing, a battery carried by said casing, an electrically operated signal means delivering a signal whenever said signal means is electrically energized, and a tilt-switch having a frame mounted on said casing, said tilt-switch having two contacts on said frame, said switch having a bridging element moving by gravity and carried by said frame toward and away from electrical contact with said contacts as said frame is tilted in each of two directions, and means electrically interconnecting said switch contacts, battery, and signal assembly in a manner such that when said casing is tipped in said directions said battery will be placed into and out of electrical connection with said signal means, attachment means for adjustably attaching said casing to a fishing rod having a first section attachable to a fishing rod and a second section attached to said casing and a third section interconnecting said first and second sections, said second section being angularly adjustable relative to said first section at said third section to adjust the angle of tilt of said second section relative to said first section.

3,882,630
STRUCTURAL ELEMENT FOR COMPOSABLE TOY CONSTRUCTIONS
Natale Bianco, Zuccarello, Italy, assignor to Brabo-Matic S.p.A., Milan, Italy
Filed Sept. 10, 1973, Ser. No. 395,878
Claims priority, application Italy, Sept. 14, 1972, 23101/72
Int. Cl. A63h *33/08*
U.S. Cl. 46—28 **2 Claims**



1. A structural element for composable toy constructions, comprising a substantially flat elongated body having spaced apart land portions defining a first transverse dimension of the element and arranged in regular intervals over the length of the elongated body and recessed portions therebetween defining a second transverse dimension of the element, the land portions each having a first longitudinal extension thereof and the recessed portions each having a second longitudinal extension thereof, the elongated body further comprising a number of cross-shaped apertures spaced apart over the length of the elongated body and each defined by a longitudinal and a transverse slot, said cross-shaped apertures each having a longitudinal span having a magnitude equal to said first transverse dimension and a transverse span having a magnitude equal to said second transverse dimension, said first longitudi-

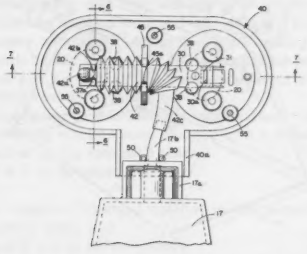
nal extension being equal to said transverse span and said second longitudinal extension being equal to said second transverse dimension.

3,882,631

DOLL WITH PNEUMATIC MEANS FOR RECIPROCALLY MOVING EYES

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Dr., Encino, Calif. 91316

Filed Feb. 19, 1974, Ser. No. 443,858
Int. Cl. A63h *3/40, 29/16*
U.S. Cl. 46—44 **11 Claims**



9. A doll having at least a torso portion and a head portion with movable eyes mounted in said head portion, the improvement comprising pneumatic actuating means in said doll for reciprocally moving said eyes including:

a slider bar mounted for reciprocating slidable motion in said head portion, the eyes being coupled to the slider bar for motion therewith,

a resilient bellows coupled to said slider bar, said bellows resiliently holding the eyes in a predetermined at-rest position, said bellows having a bulb portion formed on one end thereof and a neck portion adjacent to said bulb portion, there being a bracket mounted on the slider bar and having a slot formed therein, said neck portion being fitted into said slot,

a pliable air bottle adapted to be manually compressed, and means for providing fluid communication between the bellows and the air bottle,

whereby when the air bottle is compressed and released, the bellows expands and contracts to reciprocally drive the slider bar and eyes.

3,882,632

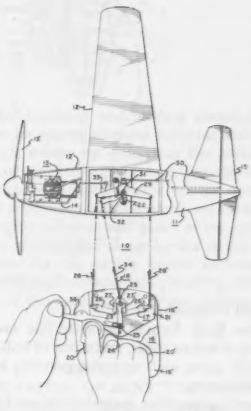
MODEL AIRCRAFT CONTROL

Milbert Quinzer, Rt. No. 2, Meridian, Idaho 83642

Filed Jan. 2, 1974, Ser. No. 430,268
Int. Cl. A63h *27/04*
U.S. Cl. 46—77 **1 Claim**

1. In combination with model aircraft having wings, fuselage, a motor assembly and throttle valve lever, and a pivotally mounted elevator, a control comprising:

a handle housing being fabricated in complementary section halves which follow a line of cut corresponding to the center line of the thickness dimension of said housing, said halves forming a grip portion having a cavity into which the index finger maybe disposed and a second cavity into which the remaining fingers of the controller maybe disposed, and a hollow housing portion including a center bar disposed in substantial alignment with the radius formed by said model aircraft, said center bar being slidably mounted in a slot disposed in said housing portion along where said radius, a pair of radius arms being disposed distally from the terminal end adjacent said aircraft and projected sidewardly from said center bar and being pivotally mounted at the terminal end opposite said center bar to said handle portion, said radius arms and said handle bar being pivotally connected by links, said handle-housing including operating lever disposed journally perpendicularly to said center bar to the side of said handle housing having said index finger cavity and being pivotally mounted distally adjacent said index finger housing, said operating lever having a rectilinearly disposed slot in its terminal end opposite said pivot point to ride on a pin of the terminal end opposite of center bar opposite said radius arms, said operating lever being provided with a portion projecting from the exterior side of said housing as a handle and with a finger pull ring fastened to the terminal side of said operating lever adjacent said grip portion in registry with said index finger cavity;



in said aircraft a T-plate having its central leg disposed transversely of said fuselage away from said housing-handle and the arms of said plate being slightly angularly disposed toward said housing handle, said T-plate being carried at its center or fulcrum point on a pin which is itself slidably carried in a slot which is cut transversely of said fuselage, an asymmetrical U-shaped plate having one leg longer and somewhat straighter than the other in the manner of a hook, and being fastened on the terminal end of the longer leg on said pin fastening and between said T-plate and said portion of said fuselage having said slot, said hooked portion of said U-shaped plate being disposed forwardly with respect to said mounting slot, and a link pivotally fastened distally from the terminal end of said longer leg of said U-shaped plate and a connecting portion which projects away from said housing handle and forwardly with respect to said fuselage;

control lines including a pair of elevator control lines fastened substantially parallelly from corresponding ends of said radius arms and the terminal end of said arms of said T-plate and a connecting rod connecting said central portion of said T-plate to said elevator or actuating said elevator and a throttle control cable fastened to the terminal end adjacent said aircraft of said center bar to the terminal end of said shorter leg of said U-shaped plate adjacent said housing-handle, the terminal end opposite said control cable of said shorter leg being connected to said throttle valve lever.

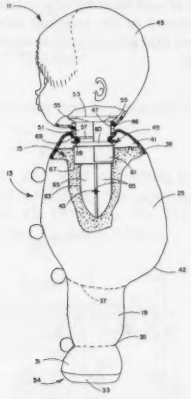
3,882,633
DOLL

Adolph E. Goldfarb, Tarzana; Judith D. Strader, and George C. Strader, both of San Dimas, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 107,016, Jan. 18, 1971, Pat. No. 3,678,616. This application Dec. 6, 1971, Ser. No. 204,913The portion of the term of this patent subsequent to July 25, 1989, has been disclaimed.

Int. Cl. A63h

U.S. Cl. 46—151 **7 Claims**



1. A doll comprising:

a hollow body formed of a flexible material, said body having a hollow torso, and a pair of hollow legs connected at their upper ends to and depending from a bottom end of said torso,

solid particulate filler material disposed within and partly filling said body,

said torso having a front side and a rear side, said torso having a rearwardly protruding portion extending from the rear side adjacent the bottom end of said torso to provide a substantially enlarged cross-section through said torso at said bottom end, the doll thereby being provided with a relatively low center of gravity and a consequent high degree of stability against sideward tilting,

the upper ends of the hollow legs each being open and in internal communication with the bottom end of said torso to permit the ready flow of particulate filler material between the torso and legs to facilitate arranging the doll in a relatively stable, upright, balanced position.

3,882,634
ROTARY PLANT GROWTH ACCELERATING APPARATUS

Richard D. Dedolph, Northfield, Ill., assignor to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 27, 1973, Ser. No. 428,995

Int. Cl. A01g *31/00*

U.S. Cl. 47—1.2 **16 Claims**

1. Rotary plant growth accelerating apparatus, comprising:

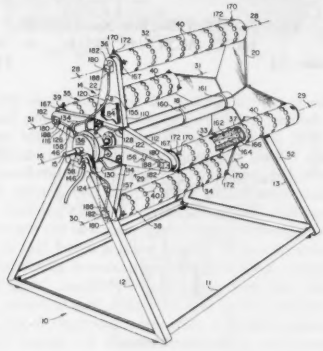
a mounting stand including a pair of spaced apart support members;

an elongated drive shaft supported by said mounting stand and having opposite ends journaled to respective ones of said pair of support members, the longitudinal axis of said drive shaft defining a primary axis about which said shaft may be rotated;

at least one pair of arms respectively affixed to opposite ends of said drive shaft and extending radially away from said drive shaft, said arms being rotatable about said primary axis with said drive shaft;

plant bed means having opposite ends journaled to the distal ends of the respective ones of said arms, said plant bed means being rotatable about a planetary axis oriented in spaced apart parallel relationship with said primary axis;

drive means for causing said drive shaft and said arms to



rotate about said primary axis and carry said plant bed means in a planetary path around said primary axis;

planetary drive means responsive to rotation of said drive shaft and operative to cause said plant bed means to rotate about said planetary axis as it is moved over said planetary path; and

means for supplying liquids to said plant bed means while they are being moved around said primary axis and rotated about said planetary axis.

3,882,635
METHOD OF PRODUCING CELLS OF ALGAE

Shigeru Yamanaka, and Koji Mitsugi, both of Yokohama, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Mar. 29, 1974, Ser. No. 455,967

Claims priority, application Japan, Mar. 30, 1973, 48-35598

Int. Cl. A01g *7/00*

U.S. Cl. 47—1.4 **2 Claims**

1. A method of producing algal cells which comprises culturing *Prototheca sphaerica* FERM P-1943 in an aqueous culture medium containing assimilable sources of carbon and nitrogen, inorganic salts, and minor organic nutrients until the cells of said *Prototheca sphaerica* multiply in said culture medium, and recovering the multiplied cells from said medium.

3,882,636
TWO-STAGE STEAM REFORMING PROCESS OF HYDROCARBONS

Akira Horie; Selichi Matsuoka, and Kenzo Yamamoto, all of Yokohama, Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1972, Ser. No. 295,120

Claims priority, application Japan, Oct. 7, 1971, 46-78348

Int. Cl. C01b *2/14*

U.S. Cl. 48—214 **8 Claims**

1. A process for producing a methane-rich gas by the steam reforming of feed hydrocarbons having two or more carbon atoms per molecule and capable of being steam reformed, comprising:

A. supplying a preheated gaseous mixture consisting of said feed hydrocarbon and steam, at a temperature in the range of 350° to 550°C, to a first reforming reaction zone

charged with a nickel reforming catalyst, the hourly rate of supplying such mixture being such that the following equation is satisfied:

$W_1/F = 0.04\alpha$ to 0.22α

wherein

W_1 = weight of charged catalyst

F = weight of supplied hydrocarbon per hour

$\alpha = 0.5 + 0.5\times10^{-5}\times M^{2.71}$

M = mean average boiling point of feed hydrocarbons in °C,

to effect an incomplete adiabatic reforming reaction in said first reaction zone to react from 20 to 80% of said feed hydrocarbon and with the remainder of said feed hydrocarbon being unreacted, thereby to produce a first gaseous reaction product containing unreacted feed hydrocarbon and unreacted steam,

B. withdrawing said first reaction product from said first reforming reaction zone and introducing it directly into a heating zone and heating it in said heating zone sufficiently to add to said first reaction product from 10 to 72 Kcal per Kg of said first reaction product to produce a heated reaction mixture, and

C. introducing said heated reaction mixture into a second reforming reaction zone charged with a nickel reforming catalyst at the rate such that

W_2/F = 1 to 20 times W_1/F

wherein

W_2 = weight of charged catalyst in the second reforming reaction zone, and

W_1 and F are as defined above,

to effect a second adiabatic reforming reaction of said heated reaction mixture to complete reaction of said feed hydrocarbon, thereby to produce a final gaseous product in which the carbon compounds present therein connsist essentially of CH_4, CO and CO_2, said final gaseous product at the exit end of the second reforming reaction zone having a temperature in the range of 350° to 550°C, and withdrawing said final gaseous product from said second reforming reaction zone.

3,882,637

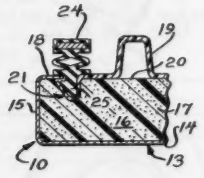
REFRIGERATOR DOOR CONSTRUCTION AND METHOD OF FORMING THE SAME

Robert E. Lindenschmidt, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 12, 1973, Ser. No. 414,864

Int. Cl. E06b *3/00*

U.S. Cl. 49—501 **19 Claims**



1. An insulated door construction comprising: an outer panel having an inturned peripheral flange means defining an insulation space adjacent said panel; insulation within said space; means on said flange defining a retaining shoulder overlying a peripheral portion of said space; an inner liner having a resilient peripheral lip portion defining an inwardly opening channel resiliently snapped under said shoulder, said inner liner covering said first space and retained in place by said snapped under relationship with said shoulder, said channel being disposed adjacent said shoulder; and door gasket means having a portion received in said channel with an edge thereof underlying said shoulder to be retained by said shoulder for sealing said liner to said outer panel.

3,882,638

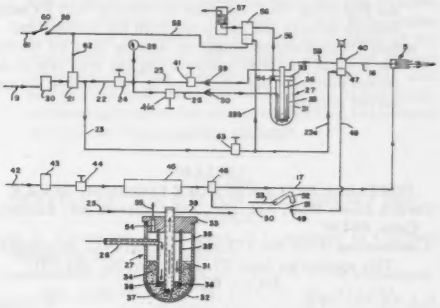
AIR-ABRASIVE PROPHYLAXIS EQUIPMENT

Robert B. Black, 2925 Denrer, Corpus Christi, Tex. 78404

Filed Oct. 4, 1973, Ser. No. 403,436

Int. Cl. B24c *7/00*

U.S. Cl. 51—12 **6 Claims**



1. A system for handling and feeding abrasive particles comprising means for mixing abrasive particles with a gaseous stream, first nozzle means for delivering the abrasive laden stream to a point of use, controllable supply means for starting and stopping the abrasive laden stream, second nozzle means in predetermined relation to the first nozzle means for delivering a stream of liquid adjacent said point of use, controllable supply means for starting and stopping the stream of liquid and control means for the supply means including means providing for substantially concurrently starting and stopping of the discharge of the gaseous and liquid streams from the nozzle means.

3,882,639

JET SAND BLASTING OF BENT TUBES OR RODS

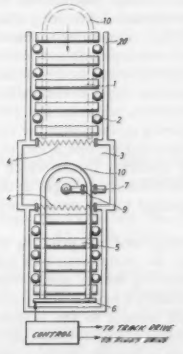
Wilhelm Kollbach, Erkrath-Unterbach, Germany, assignor to Mannesmannrohren-Werke AG, Dusseldorf; Kraftwerk Union AG, Erlangen, both of, Germany and Sandvik Aktiebolaget, Sandviken, Sweden

Filed July 30, 1974, Ser. No. 493,090

Claims priority, application Germany, July 30, 1973, 2338994

Int. Cl. B24c *3/12, 3/32*

U.S. Cl. 51—14 **4 Claims**



1. Apparatus for sandblasting hairpin bent tubes or rods comprising:

a blasting chamber with aligned entrance and exit;

a first roller track disposed for moving such tubes or rods to and into the blasting chamber through the entrance;

a second roller track disposed for moving the tubes or rods from the blasting chamber when emerging from the exit; an annular duct with radially inwardly directed blasting nozzles disposed in the blasting chamber so that one leg of a bent tube or rod, when moved into the chamber by the first roller track, traverses the annular duct for sandblasting through jets as ejected from the nozzles; and

means for pivotally mounting the annular duct for moving the annular duct with nozzles along the bent axis of the curved portion of the tube or rod for sandblasting the said curved portion.

3,882,640

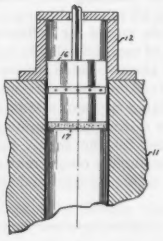
PORTABLE PRECISION HOLE FINISHING DEVICE

Gordon James Watt, Apt. 106, 245 Unquowa Rd., Fairfield, Conn. 06430

Continuation of Ser. No. 172,985, Aug. 19, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,531

Int. Cl. B24b *5/40*

U.S. Cl. 51—34 H **5 Claims**



1. In a hole finishing apparatus having a rotatably supported, elongated, generally cylindrical member, the cylindrical surface of which constitutes a hydrostatic bearing surface adapted to cooperate with a complementary surface of a hole in a workpiece for maintaining the elongated member coaxial with the hole, the elongated member having mounting means which supports a hole finishing tool near the leading end of the member, the member being connected behind its leading end to a rotatable and axially translatable hollow drive shaft through which pressurized lubricating fluid may be fed to clearance between the cooperating surfaces, wherein:

a. the hydrostatic bearing surface constituted by the cylindrical surface of the elongated member includes respective outlet restrictor edges at the leading end and trailing end of the member, whereby the concentricity of the hydrostatic bearing surface with the complementary surface of the hole during operation of the apparatus is maintained by restoring forces which are derived from lubricating fluid pressure changes at the outlet restrictor edges and imparted to the main bearing areas therebetween;

b. the hole finishing tool is a grinding wheel mounted directly adjacent the outlet restrictor edge at the leading end by the mounting means, said mounting means being arranged to produce a mass imbalance at the tool mounting region with respect to the longitudinal axis of the elongated member during rotation thereof; and

c. the hollow shaft is flexible and is connected to the elongated member by a coupling capable of transmitting pressurized lubricating fluid from the drive shaft to passageway means in the elongated member leading to respective inlet edges of the hydrostatic bearing surface associated with said outlet restrictor edges thereof.

3,882,641

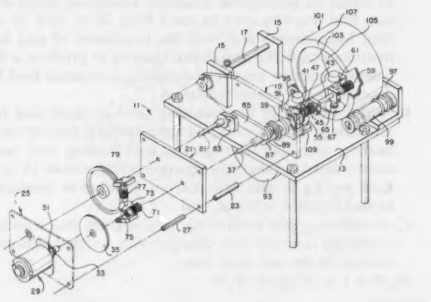
CABOCHON GEM GRINDER

Earl D. Montgomery, and Jan Michael Montgomery, both of Warrington, Pa., assignors to The American Standard Corporation, Trevose, Pa.

Filed Dec. 28, 1973, Ser. No. 429,084

Int. Cl. B24b *7/00, 9/00, 1/00*

U.S. Cl. 51—73 R **5 Claims**



1. A cabochon gem grinding machine comprising a drum having a cylindrical wall and a lip extending inwardly from the sides of the wall for retaining a slurry of abrasive material, means mounting the drum so that its axis is horizontal and for rotating the drum to distribute and maintain the slurry against the inner wall of the drum, dop means for holding a gem to be ground in contact with the slurry at a desired angle to the vertical to grind a desired area of the gem, and pattern means connected to the dop means for indicating the desired shape of the gem.

3,882,642

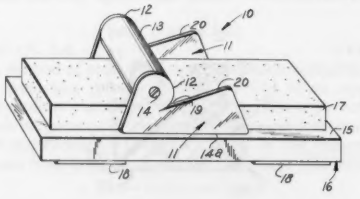
KNIFE SHARPENER

C. S. Sykes, P.O. Box 12573, Fort Worth, Tex. 76116

Filed Dec. 20, 1973, Ser. No. 426,805

Int. Cl. B24b *3/36*

U.S. Cl. 51—157 **2 Claims**



1. A knife sharpening device comprising:

a sharpening stone having a generally flat top sharpening surface and a given length and width with elongated parallel sides defining the width thereof,

support structure for supporting said stone and having a width and length greater than the width and length respectively of said stone,

said support structure being adapted to support said stone in a position to locate the sides defining the width and length of said stone inward of the sides defining the width and length of said support structure and to locate said top sharpening surface of said stone above the top surface of said support structure,

the top surfaces of said support structure on the elongated sides of said stone being generally parallel with each other and with the top sharpening surface of said stone,

a pair of leg members having straight bottom edges for slidably engaging the top surfaces of said support structure on the elongated sides of said stone,

said leg members each having first and second portions comprising a generally circular edge and a generally straight and oblique edge respectively adapted to extend above the top surface of said stone when their bottom edges engage the top surfaces of said support structure on the elongated sides of said stone,

said generally circular edge and said generally straight and oblique edge of each leg member meet to form a generally V-shaped groove,

said generally straight and oblique edges defining acute angles relative to lines parallel to the bottom edges of said leg members respectively,

a cylindrical member having opposite ends connected to said first portions of said leg members respectively for spacing said leg members apart in generally parallel relationship with each other,

said cylindrical member being connected to said first portions at positions to have its surface generally flush with said circular edges of said first portions of said leg members,

said cylindrical member having a length such that said leg members may straddle the width of said stone to allow the bottom edges of said leg members to slidably engage said top surfaces of said support structure on the elongated sides of said stone,

said cylindrical member being connected to said first portions of said leg members at positions to allow said cylindrical member to be located above the top surface of said stone whereby said leg members may be slid along the length of said top surfaces of said support member on the elongated sides of said stone to move said cylindrical member above the top surface of said stone,

said V-shaped grooves of said leg members being adapted to receive the blade edge of a knife to allow it to be sharpened by said stone,

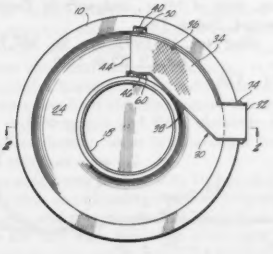
said two leg members with said cylindrical member connected therebetween being adapted to be removed from said support structure by lifting upward and to be located in reverse positions relative to said support structure and said stone.

3,882,643

LOCKING MECHANISM FOR A VIBRATORY MILL

Jon A. Knartzer, Buena Park, Calif., assignor to Sweco, Inc., Los Angeles, Calif.

Filed May 4, 1973, Ser. No. 357,512
Int. Cl. B24b *31/12*
U.S. Cl. 51—163 **9 Claims**



1. A lock mechanism for supporting and locking equipment on a vibratory mill, comprising

two non-circular pins rigidly fixed to the equipment having mutually coincident axes;

receiving means for receiving said non-circular pins, said receiving means including two rigid brackets having U-shaped channels cut therethrough and resilient receiving elements lining said channels into which said non-circular pins can be positioned; and

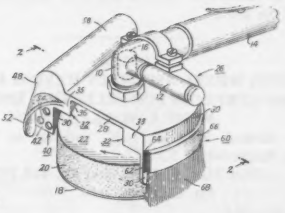
said non circular pins each having a minor cross-sectional dimension which fits within each resilient receiving element and a major cross-sectional dimension which is wider than said U-shaped channel with said resilient receiving element in position, said non-circular pins and said resilient receiving elements being capable of interlocking engagement by placement of said non-circular pins in said U-shaped channels and by rotation of the equipment relative to said vibratory mill about an axis coincident with the axes of the non-circular pins, said non-circular pins being forced along the major cross-sectional dimension thereof into interlocking engagement with said resilient receiving elements.

3,882,644

DUST COLLECTOR FOR PORTABLE ROTARY DISC GRINDER

Guy F. Cusumano, Englishtown, N.J., assignor to Clarkson Industries, Inc., New York, N.Y.

Continuation of Ser. No. 368,102, June 8, 1973, abandoned.
This application May 24, 1974, Ser. No. 473,234
Int. Cl. B24b *23/02, 55/06*
U.S. Cl. 51—170 T **14 Claims**



13. A dust-extracting device adapted to be used in conjunction with a motor driven rotary grinder to collect dust formed during operation of said grinder, said dust-extracting device comprising a truncated circular dust-extracting hood adapted to be positioned between said motor and disc and to overlie said disc, said hood including a depending arcuate skirt a dust induction chamber formed at one end of said skirt, said chamber having a front wall substantially perpendicular to said skirt, said wall having a series of holes formed therein and being positioned to receive dust particles generated by operation of said grinder, an arcuate brush mounted on the skirt of said hood and extending downwardly therefrom and a suction conduit connected to said chamber for drawing air and dust particles formed during operation of said grinder through said chamber and away from said hood.

3,882,645

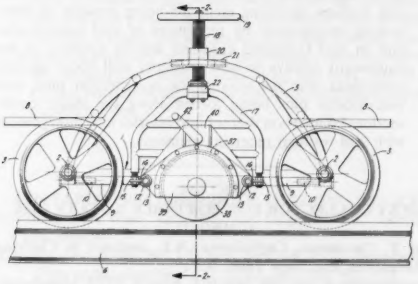
RAILROAD RAIL GRINDING MACHINE

Willard J. Duecker, Stockton, Calif., assignor to Colberg, Inc., Stockton, Calif.

Filed June 10, 1974, Ser. No. 478,074
Int. Cl. B24b *23/02*
U.S. Cl. 51—178 **7 Claims**

1. A railroad rail grinding machine comprising a frame having transversely spaced, rail engageable wheels adjacent the ends thereof, a transverse shaft disposed intermediate the frame ends, a grinding wheel on the shaft adjacent one of the rails which the wheels engage, an engine connected in driving relation to the shaft, and means mounting the shaft and engine in supported connection with the frame and for vertical and axial adjustment of the shaft, selectively and independently, whereby to correspondingly adjust the grinding wheel relative to said one rail; said mounting means including a longitudinal

rock-shaft journaled on the frame laterally of said one rail, spaced mounting rods fixed on the rock-shaft and projecting toward said one rail, a sliding structure on the mounting rods, the shaft being journaled on and the engine supported by such sliding structure, means between the frame and mounting rods



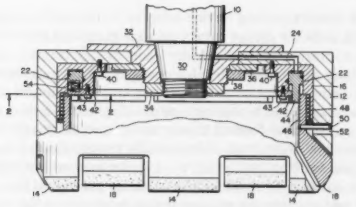
operative to adjust the latter vertically and about the rock-shaft as an axis, and other means between the mounting rods and said sliding structure to adjust the latter along said rods, whereby to effect said vertical and axial adjustments, respectively, of the shaft.

3,882,646

GRINDING WHEEL ASSEMBLY HAVING MULTIPLE GRINDING SURFACES FOR SELECTIVE ENGAGEMENT WITH A WORKPIECE

Gene A. Stritzel, Webster, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,782
Int. Cl. B24d *7/14, 7/18*
U.S. Cl. 51—204 **10 Claims**



1. A cup-shaped grinding wheel assembly for grinding tooth slots into face coupling members, comprising

a first cup-shaped member having a first series of spaced grinding surfaces formed on a projecting rim portion therof,

a second cup-shaped member having a second series of grinding surfaces arranged in positions between the positions of said first series of grinding surfaces, said second cup-shaped member being fitted within said first cup-shaped member for carrying said second series of grinding surfaces for axial movement relative to the first cup-shaped member,

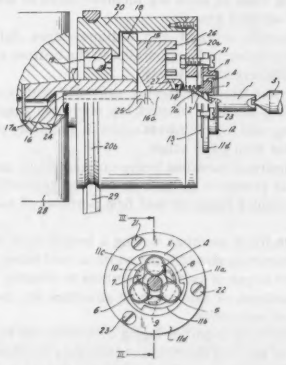
actuating means for advancing and retracting said second series of grinding surfaces into and out of grinding positions relative to the positions of said first series of grinding surfaces, whereby the second series of grinding surfaces can be brought into engagement with a workpiece while the first series of grinding surfaces are out of engagement with the workpiece, and then the first series of grinding surfaces can be brought into engagement with workpiece while the second series of grinding surfaces are out of engagement with the workpiece.

3,882,647

WORKPIECE HOLDER

Ekkehard Flaischlen, Stuttgart, Germany, assignor to Fortuna-Werke Maschinenfabrik AG, Stuttgart, Germany

Filed Apr. 4, 1973, Ser. No. 347,918
Claims priority, application Germany, Apr. 12, 1972, 2217432
Int. Cl. B24b *5/04*; **B23b** *33/00, 5/08, 31/12*
U.S. Cl. 51—237 R **8 Claims**



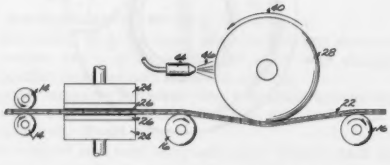
1. A workpiece holder, comprising an annular member having an opening bounded by at least three curved cam portions each extending circumferentially and from a point farthest spaced from to a point closest to the center axis of said opening; at least three gripping rollers in said opening and each associated with one of said cam portions, said rollers defining between themselves a workpiece-receiving passage coaxial with said central axis; spring means permanently biasing said rollers radially outwardly and into engagement with said cam portions; a guide member mounting said rollers and guiding the same for movement relative to said annular member in direction closer to and further from said central axis; rotating means for rotating said annular member about said central axis; and retarding means operable for retarding said guide member against rotation in unison with said annular member.

3,882,648

METHOD FOR IMPROVING THE STAINLESS STEEL SURFACE FINISH ON A COMPOSITE METAL LAMINATE

Joseph J. Buchinski, Wrentham, and Thaddeus Smietana, Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 17, 1972, Ser. No. 307,708
Int. Cl. B24b *1/00*
U.S. Cl. 51—328 **4 Claims**



1. Method for providing a high quality surface finish corresponding to AISI Surface Finish No. 8 on the stainless steel surface of a composite roll-bonded stainless-steel-aluminum-laminate strip material where said stainless steel surface is characterized by a matte finish and by a root mean square surface roughness of about 20 R.M.S. and is substantially free

of surface defects of a depth greater than about 30 microinches, said method comprising the steps of advancing said strip material over a series of spaced supporting rolls under substantial tension with said stainless steel surface facing away from said supporting rolls, rotating a series of fabric buffing rolls of moderate abrading properties in the direction of advance of said strip material on axes disposed normal to said direction of advance while oscillating said buffing rolls to a controlled limited extent along said buffing roll axes and while pressing said buffing rolls against said stainless steel surface with sufficient force between respective pairs of said supporting rolls for obtaining a wrap of an arc of between 20° and 40° of said tensioned strip material against the peripheral surfaces of each of said buffing rolls to provide substantial areas of buffing engagement between said stainless steel surface and said buffing rolls, and intermittently projecting abrasive particles of moderate abrading properties free of a gaseous carrier medium at a force in excess of about 600 pounds per square inch substantially radially onto respective surfaces of said fabric buffing rolls to penetrate said buffing rolls to a significant extent with said abrasive particles for assuring that said abrasive particles are carried by said buffing rolls throughout said areas of buffing engagement.

3,882,649

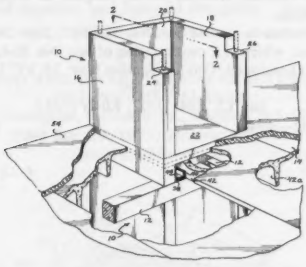
INTERLOCKED MODULAR BUILDING SYSTEM

Francis Mah, 1682 Lawrence Pl., Memphis, Tenn. 38112; Walk C. Jones, III, 360 Tara Ln., Memphis, Tenn. 38111, and William J. LeMessurier, 402 Linden St., Wellesley, Mass. 02181

Continuation of Ser. No. 121,465, March 5, 1971, abandoned. This application Apr. 27, 1973, Ser. No. 354,986

Int. Cl. E04b *1/348*

U.S. Cl. 52—79 **21 Claims**



1. A modular building structure, comprising:

a plurality of fixedly interconnected structural elements, aligned connecting means on each of said structural elements fixedly connecting said structural elements together, said structural elements including vertically extending modules, horizontally extending beams, and horizontally extending floor elements, means fixedly connecting each of said beams and floor elements at at least spaced points thereon to at least another one of said structural elements,

said modules each being substantially U-shaped in horizontal cross section and including a pair of vertically extending side walls and a vertically extending back wall connected to the side walls, said side walls each having an upper marginal edge surface and a lower portion with at least one beam receiving recess in each of said upper marginal edge surfaces,

said beam receiving recesses being located in the front marginal edges or corners of the upper edge surfaces of the side walls and comprising step recesses having a depth and width corresponding to the cross sectional thickness of a beam so that a beam positioned in a recess is flush with the edge surfaces of the modules,

at least some of said beams received in said recesses and each fixedly connected at at least two spaced points thereon to said modules, and each fixedly connected at a third point thereon to another one of said structural elements,

said floor elements each being elongate and substantially rectangularly shaped and supported on said beams in a horizontal position, each of said floor elements being fixedly connected at at least two spaced points thereon to at least one other of said structural elements, and fixedly connected at a third point thereon to another one of said structural elements,

adjacent connecting means on said structural elements being aligned and operatively secured together to fixedly secure said beams, modules, and floor elements together to define a three-dimensional space frame which resists horizontal and vertical loads.

3,882,650

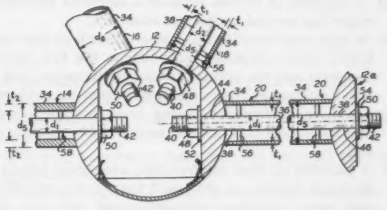
PIPE-AND-BALL TRUSS ARRAY

Paul F. Gugliotta, 39 E. 20th St., New York, N.Y. 10003

Filed May 21, 1974, Ser. No. 471,874

Int. Cl. E04b *1/56*

U.S. Cl. 52—223 R **14 Claims**

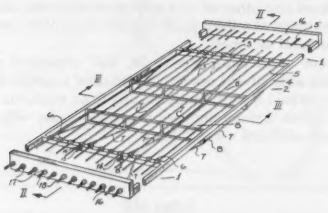


1. A pipe-and-ball truss array comprising a plurality of truss members, at least a first hollow spherical member portion common to said plurality of truss members and first means for joining said plurality of truss members to said first spherical member portion, each of said truss members comprising a outer hollow pipe element having a longitudinal axis and first and second ends and an inner rod element extending through said outer hollow pipe element along said longitudinal axis, said inner rod element having first and second ends, said first spherical member portion having a plurality of spaced apart apertures extending from the exterior surface thereof to the interior thereof, each of said inner rod element first ends extending beyond said outer hollow pipe element first end and through an associated one of said first spherical member portion apertures and having threads thereon, each of said outer hollow pipe element first ends bearing against said first spherical member portion exterior surface, said first joining means comprising first threadable nut means threadably mounted in said first spherical member portion interior on said inner rod element threaded first ends and bearing against the interior surface of said first spherical member portion for simultaneously placing said inner rod element of said truss member in tension and said outer hollow pipe element of the same truss member in compression, whereby applied tensile, compressive and axial forces are transferrable between said joined truss members through said first spherical member.

3,882,651
FLOOR SUPPORTING FRAMEWORK

Timothy Michael Gilchrist, Mavis Bank, Newrath, Waterford, Ireland

Filed June 14, 1973, Ser. No. 369,935
Claims priority, application Ireland, June 19, 1972, 854/72
Int. Cl. E04c *3/26*
U.S. Cl. 52—226 **7 Claims**



1. A floor supporting framework which comprises in combination:

A. a rigid self-supporting peripheral frame defined by four joining beam members,

B. a plurality of first and second anchorage members disposed on opposing beam members of said frame,

C. a plurality of first tensioned elements mounted in a plane between the first anchorage members, said first tensioned elements disposed to support a floor surface,

D. a plurality of second tensioned elements mounted between the second anchorage members,

E. a rigid load transferring frame defined by four joining lattice beams disposed intermediate the first tensioned elements and the second tensioned elements, said rigid load transferring frame disposed within the said peripheral frame between opposing beam members opposite that containing said first and second anchorage members, and

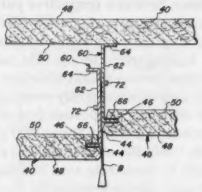
F. a plurality of rigid intermediate anchorage beams each disposed between a rigid load transferring member and said beam members containing said first and second anchorage members, said intermediate anchorage beams being positioned within the said peripheral frame between opposing beam members opposite that containing said first and second anchorage members, means disposed on said intermediate anchorage beams for anchorage of said first tensioned elements, said second tensioned elements being disposed through said intermediate anchorage beams.

3,882,652
DEMOUNTABLE PARTITION ASSEMBLY AND STUDS THEREFOR

Maurice J. Marchello, Hickory Hills, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 384,820, Aug. 2, 1973, Pat. No. 3,844,085. This application June 19, 1974, Ser. No. 480,982
Int. Cl. E04b *2/82*
U.S. Cl. 52—481 **9 Claims**

1. A partition assembly including first and second stud members each having a web portion, said stud members being positioned with said web portions thereof in parallel closely adjacent opposed relation to one another, and first and second partition members along one side of said stud members, said partition members having edges adjacent one another to define a joint therebetween in substantial alignment with the interface between said web portions, and each of said partition members forming said joint being attached to the respective adjacent stud member, each of said web portions having an opening therethrough, portions of said openings in said opposed web portions being in registry with one another, a locking tab having one end resiliently attached to said web portion of said first stud member adjacent said opening therein and extending longitudinally of said web portion from said one end in registry with said registered portions of said openings and being otherwise unattached, said tab including an intermediate locking portion normally projecting into said opening in said second stud member, said tab engaging the lateral sides of said opening in said second stud member to interlock said

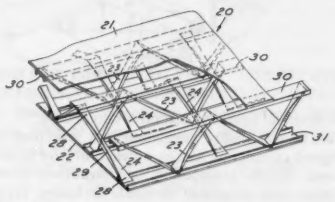


pair of stud members against relative lateral movement therebetween, and said tab being resiliently retractable into said opening in said web of said first stud member from said opening in said second stud member for disengagement from said second stud member to permit relative lateral movement between said pair of stud members for selective removal from said assembly of one of said stud members and said partition member attached thereto.

3,882,653
TRUSS CONSTRUCTION

Melvin L. Ollman, Detroit, Mich., assignor to C-O, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 158,567, June 30, 1971, abandoned, which is a continuation of Ser. No. 864,982, Oct. 9, 1969, abandoned. This application Mar. 16, 1973, Ser. No. 342,199
Int. Cl. E04c *3/02*; **E04b** *1/343*
U.S. Cl. 52—694 **24 Claims**



1. The combination comprising an undulating member comprising a strip of substantially uniformly thick material having a greater width than thickness,

said undulating member comprising alternating first and second apices connected by legs,

the first apices of said undulating member being bonded to said first channel,

a second channel comprising a base and spaced side walls, the second apices of said undulating member being bonded to said second channel,

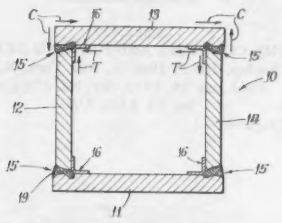
the walls of one of said channels are cut substantially throughout their widths adjacent an apex and the walls of the other of said channels are cut substantially throughout their widths intermediate a pair of apices opposed to said apex of said one channel, the bases of each said channel being bent inwardly at said cut portions.

3,882,654

STRESS-RELIEVED WELDMENT FOR BOX SECTIONS

John W. Yancey, Aurora, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Apr. 9, 1973, Ser. No. 348,926
Int. Cl. E04c 3/00
U.S. Cl. 52—758 B 4 Claims



1. A stress-relieved weldment comprising a pair of trasversely disposed first and second plates, with an edge of said second plate being disposed in edge facing relationship relative to the inner surfaces of said first plate,

an L-shaped angle bar having first and second legs abutting inner surfaces of said first and second plates, respectively, the thickness of each of the legs of said angle bar being from one-eighth to one-third of the thickness of a respective one of said plates and

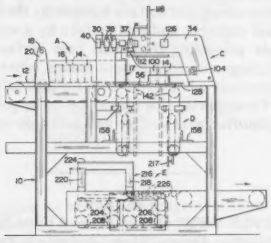
common weld means securing said plates and said angle bar together wherein said weld means penetrates through said second plate and has a root that penetrates through an apex of said angle bar, joining the first and second legs thereof together, and into said first plate.

3,882,655

METHOD AND APPARATUS FOR ERECTING AND FILLING TRAY BLANKS

Alfred C. Monaghan, 9 Gentry Dr., Warren, N.J. 07060

Filed Jan. 19, 1973, Ser. No. 325,084
Int. Cl. B65b 11/08
U.S. Cl. 53—3 11 Claims



1. Apparatus for erecting and filling tray blanks with articles comprising:

a frame having an article collecting area,

means for feeding a tray blank to said article collecting area, means on said frame to slide or feed articles onto a tray blank at said article collecting area,

a plurality of endless means having vertical operative courses to engage a tray blank and move edge and end flanges thereon upwardly,

driven pusher means on said frame to engage the tops of articles at said article collecting area and force them and their supporting tray blank downwardly into engagement with said belt means,

a second plurality of endless belt means having vertical operative courses to engage corner tabs on said blank and move them up into operative positions when said first belt means are engaging said tray blank, and

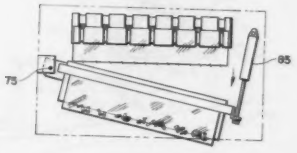
discharge means below said endless belt means to receive trays as released thereby.

3,882,656

PACKAGING METHOD AND APPARATUS

Bernard Lerner, Hudson, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Division of Ser. No. 139,453, May 3, 1971, Pat. No. 3,815,318.
This application Dec. 6, 1973, Ser. No. 422,281
Int. Cl.[2] B65B 43/12, 43/36, 51/00
U.S. Cl. 53—29 4 Claims



1. A method of packaging comprising the steps of:

a. providing structure defining a loading station;

b. feeding packaging web along a feed path to the loading station;

c. registering a container formed on the web with the loading station; and

d. while said container is at the loading station and without moving said container into registry with another station:

i. loading said container;

ii. closing said loaded container;

iii. gripping a portion of said closed loaded container in such fashion as will effectively isolate an adjacent portion of said container from stress producing forces imposed on another portion of said container; and,

iv. while said container is so gripped, initiating the performance of an operation on said container which will impose stress producing forces on said another portions, whereby said adjacent portion remains effectively isolated from said forces.

3,882,657

BAG FEEDING APPARATUS FOR BAG CLOSING MACHINE

Harold Fischbein, Edina; I. George Fischbein, and Sam Shark, both of Minneapolis, all of Minn., assignors to Dave Fischbein Manufacturing Co., Minneapolis, Minn.

Filed Aug. 2, 1973, Ser. No. 385,105
Int. Cl. B65b 7/06, 57/00
U.S. Cl. 53—77 10 Claims

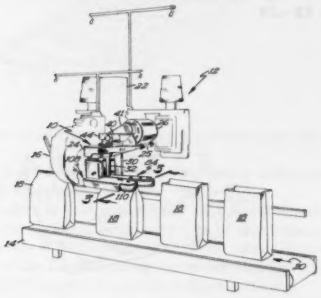
10. A bag feeding apparatus usable with a bag closing machine having a sewing head and drive means wherein open-topped bags are carried along a path at a predetermined, linear velocity past the sewing head comprising:

a mechanical transmission drivingly connectable to the drive means to receive rotational energy therefrom,

a pair of bag guiding assemblies positionable along the path in side-by-side relationship on opposite sides thereof, each of said guiding assemblies including a moveably mounted endless bag engaging belt drivingly connected to

said mechanical transmission and each of said belts having a segment substantially parallel to and closely adjacent the path, said segments of said guiding assemblies being on opposed lateral sides of the path in confronting relationship with one another, said endless belts moving at a velocity compatible with the linear velocity at which the bags are carried along the path and cooperating so as to closely engage bag tops as the bags are carried along the path and to guide the bags to the sewing head for stitching; and

means mounting at least one of said bag guiding assemblies for freely floating movement of the entire bag guiding assembly between a rest position, wherein said movably



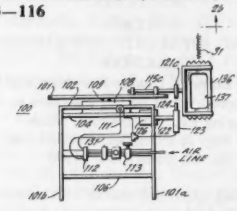
mounted assembly is closely adjacent the other one of said assemblies to thereby permit closely engaging a bag top therebetween, and a displaced position, wherein said movably mounted bag guiding assembly is spaced from the other one of said bag guiding assemblies to permit an oversized object exceeding the thickness of a bag top to pass between said assemblies, said movably mounted bag guiding assembly freely floatable between said rest position and displaced position during guiding of bag tops along the path by said bag guiding assemblies, said parallel belt segments remaining substantially parallel to the path during said floating movement of said movably mounted assembly.

3,882,658

APPARATUS FOR WRAPPING AND CUTTING MATERIAL OF INDETERMINATE LENGTH

William B. Cleary, Philadelphia, Pa., assignor to Abraham S. Kinderman, Philadelphia, Pa.

Filed Mar. 16, 1973, Ser. No. 342,177
Int. Cl. B65b *63/04*; **B65h** *54/14*, *54/24*
U.S. Cl. 53—116 **13 Claims**



9. Apparatus for winding elongated filamentary material of indeterminate length comprising:

means for selectively dispensing said material in a downward direction;

a thin flat rectangular shaped insert having a large central opening;

means for slidably receiving said insert near opposite parallel ends of said insert;

means for rotating said receiving means, thereby rotating said insert;

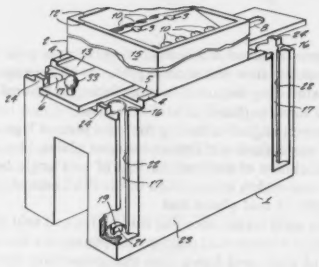
said receiving means being positioned beneath said dispensing means enabling the free end of said material to pass through said opening as said receiving means is rotated to automatically wrap said material about said insert.

3,882,659

COIN COUNTING AND PACKING DEVICE

Herbert Charlop, 245 E. 19th St., New York, N.Y. 10003

Filed July 16, 1973, Ser. No. 379,616
Int. Cl. B65b *5/10*
U.S. Cl. 53—254 **10 Claims**



1. A coin-counting device having means for stacking coins of a similar size in a cylindrical stack and means for transporting said coins from said stack to a receptacle, in which the first said means comprises a hopper with a cylindrical chamber adapted for stacking coins of similar size and in which the second said means comprises a coin transporter, a base and a stationary coin-guide, said base including a stationary surface transverse to and spaced from said cylindrical chamber with said coin transporter slidably mounted therebetween guided for movement along said surface transversly through the space between said chamber and said surface by a stationary transporter guide projecting from said base surface, said transporter including coin-engagement means, whereby actuation of said transporter will move a coin through said space in the direction of transporter movement due to the guiding coaction of said transporter, said surface and said coin and transporter guides.

3,882,660

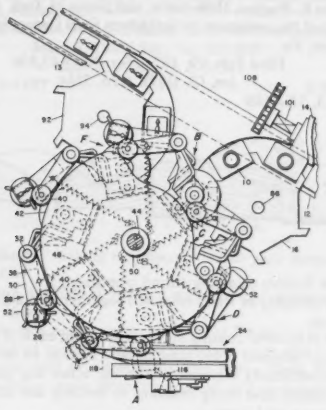
CAPPER WITH ORIENTING ATTACHMENT

Walter S. Sterling, Quincy, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed May 9, 1974, Ser. No. 468,485
Int. Cl. B67b *3/06*, *3/062*; **B65b** *7/28*
U.S. Cl. 53—308 **18 Claims**

1. Apparatus for applying closures to containers wherein the containers are supported standing up in a predetermined position of orientation for movement along a predetermined path and closures are delivered one at a time to a position close to said path in a predetermined position of orientation relative to the containers, comprising a transfer arm supported for angular movement about a vertical axis from said path to said position and back to said path, said transfer arm being adapted to support a closure at said path for application to a container and means for rotating the closure about a vertical

axis as the transfer arm moves from said position to said path to re-orient the position of the closure by the amount it became displaced by such angular movement of the transfer arm.



3,882,661
APPARATUS FOR BENDING THE EDGE OF A FOIL AROUND THE EDGE OF A TRAY

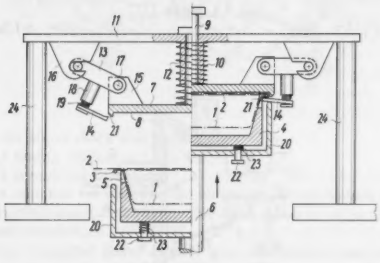
Eugen Schierle, In den Ringelgarten 58, D-7000 Stuttgart, Germany

Filed Oct. 19, 1973, Ser. No. 408,111

Claims priority, application Germany, Oct. 27, 1972, 2252927

Int. Cl.[2] B65B *7/28;* **B67B** *3/14*

U.S. Cl. 53—354 **11 Claims**



1. An apparatus for bending the edge of a foil of aluminium or a similar material around an outwardly projecting edge of a tray, the tray being provided with straight edge portions and corner portions connecting the straight edge portions, the apparatus comprising: a base plate means, a centering basket means for receiving and holding the tray with the foil disposed thereover, a stop plate means disposed above and spaced from said centering basket means, means for selectively displacing said centering basket means into engagement with said stop plate means, means for mounting said stop plate means to permit limited displacement thereof by said centering basket means, a plurality of slide means for contacting and bending the respective edges of the foil from the outside thereof, pivot means connected with said base plate means and said stop plate means for pivotally mounting said slide means to permit at least a portion of said slide means to effect successive movement in a first direction toward the tray and in a second direction substantially perpendicular to the edge of the tray, the movement of said slide means in the first direction being effected by the limited displacement of said stop plate means by said centering basket means, and a closing bracket means movable with said centering basket means for contacting said slide means to effect movement of said slide means in the second direction after said centering basket means contacts said stop plate means.

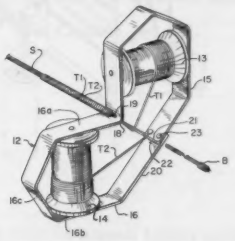
3,882,662
DUAL LINE BOWSTRING SERVER

Loren Richard Hazelwood, 544 S. Xavier, Denver, Colo. 80219

Filed Aug. 7, 1972, Ser. No. 278,550

Int. Cl. B65h *81/06*

U.S. Cl. 57—10 **8 Claims**



5. In a bowstring server for simultaneously serving line from two spools about core strands, a frame for the spools having:

a. a pair of spool support sections arranged in an angularly disposed relation facing one another, each said spool support section having bearing means for supporting the spools for rotation about axes substantially perpendicular to each other at a substantially uniform tension during payout of the line from the spool,

b. line guide means to direct the line away from the spools during payout, and

c. a serving head with a discharge aperture located between said spool support sections at substantially the center of gravity of the frame with the spools in place thereon and through which the lines pass whereby the frame and spools will rotate about the strands to simultaneously form two wraps arranged side by side on the core strands.

3,882,663
DEVICE FOR SEQUENTIAL STARTING AND STOPPING SEPARATE GROUPS OF OPERATING MEANS IN ADJUSTABLE TIME INTERVALS

Jiri Soukup; Julius Varga; Jan Sterba, and Ladislav Bures, all of Usti Nad Orlici, Czechoslovakia, assignors to ELITEX, Zavody textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia

Filed Aug. 28, 1973, Ser. No. 392,338

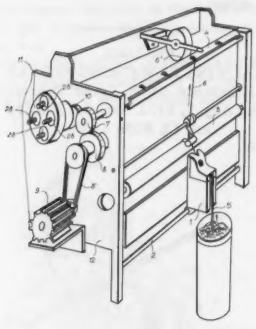
Claims priority, application Czechoslovakia, Aug. 30, 1972, 5952-72

Int. Cl. D01h *1/28, 1/08, 15/00*

U.S. Cl. 57—34 R **5 Claims**

1. In an open end spinning machine having a plurality of groups of open end spinning units, each such group having means for withdrawing yarns from the spinning units of such group and means for winding the yarns withdrawn from the spinning units of such groups, and common driving elements for the yarn withdrawing and winding means of each such group, a common element for driving the yarn withdrawing and yarn winding means of each group of spinning units, mass piecing being performed by reversing the run of both the yarn withdrawing and the yarn winding elements, the improvement which comprises electrical controlled mechanism provided with a plurality of switch elements, each switch element being

operatively associated with a respective group of spinning units and each switch element being adjustable to determine the time of operation of the yarn withdrawing and the yarn winding means of the respective group of spinning units, at



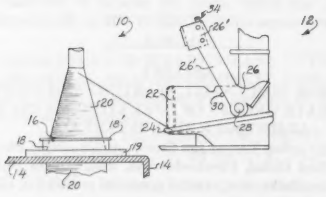
least one driven control element for each of the switch elements, means for driving the control elements from one of the common driving elements and a controllable clutch interposed between said one of the common driving elements and said control elements.

3,882,664

YARN DEFLECTING MEANS FOR AUTOMATIC YARN PIECING APPARATUS

Luther A. Cleland, Westminster, S.C., assignor to Saco Lowell Corporation, Easley, S.C.

Filed Oct. 17, 1973, Ser. No. 407,126
Int. Cl. D01h *15/00*
U.S. Cl. 57—34 R **10 Claims**



1. In combination with an automatic yarn piecing apparatus servicing a textile spinning machine, including a spinning ring having a traveler flange encircling a yarn collection package, said apparatus including yarn positioning means for establishing a length of yarn extending from said package to and across said flange of said spinning ring, and traveler threading means for moving a traveler about said ring flange and onto said yarn extending across said flange, the improvement comprising:

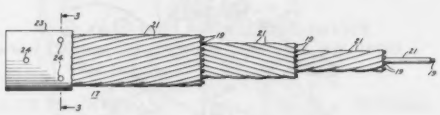
yarn deflecting means for engaging said length of yarn at a location thereon intermediate said package and said ring flange and at desired times during operation of sid traveler threading means, and for deflecting a section of said yarn adjacent to and inwardly of said spinning ring flange into a position favorable to the mounting of said yarn by said traveler upon movement thereof about said ring flange by said traveler threading means.

3,882,665

FLEXIBLE PUMPING STRAND AND METHOD OF MAKING

Charles R. Hughes, Hellertown, and James M. Doll, Allentown, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 19, 1974, Ser. No. 443,930
Int. Cl. D07b *1/16, 7/14*
U.S. Cl. 57—149 **24 Claims**



1. A flexible pumping strand comprising:

a. a plurality of wires collected together into a linear member,

b. a polymeric coating on the exterior of each of said wires, said polymer being substantially inert to an oil well fluid, substantially impermeable to the water and gaseous corrodants and being resistant to fretting and abrasion between said wires,

c. said polymeric coating being closely bonded to the surface of said wires through a thin film of an intermediate primer,

d. an outer plastic jacket coating the outside of said strand,

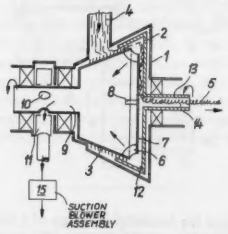
e. said outer plastic jacket having perforations throughout its length such that free passage of an oil well fluid through the plastic jacket is assured.

3,882,666

METHOD OF SPINNING YARNS IN SPINNING TURBINES

Peter Müller, Lesum, Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Germany

Filed Dec. 6, 1973, Ser. No. 422,144
Claims priority, application Germany, Dec. 28, 1972, 2263730
Int. Cl. D01h *1/12*
U.S. Cl. 57—156 **6 Claims**



1. In a method for independently extracting air from an open-end spinning turbine having an inlet region and a yarn extraction region spaced axially therefrom, during the formation of yarn from a stream of fibers fed into the turbine at the inlet region, in which air is drawn into the turbine together with such fibers, is guided into the turbine by a surface of a hollow body at least partially enclosed by the turbine, and is sucked out of the turbine in a direction having an axial component directed toward the inlet region, the improvement wherein the sucking of air out of the turbine comprises: sucking air through an annular gap provided in the body ; and directing the air from the region of such gap toward the axis of rotation of the turbine.

3,882,667
METHOD OF MAKING A COMPOSITE YARN

Gerald F. Barry, Barrington, R.I., assignor to Brunswick Corporation, Skokie, Ill.

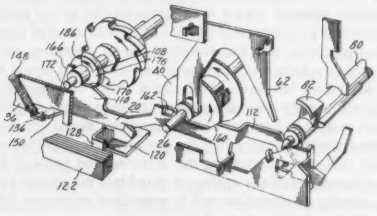
Division of Ser. No. 19,442, March 13, 1970. This application Mar. 5, 1973, Ser. No. 337,937
Int. Cl. D02g *3/12, 3/04*
U.S. Cl. 57—157 AS **2 Claims**

1. A method of making a composite textile yarn comprising the steps of:
   a. spinning a blended yarn of metallic and non-metallic staple fibers
   b. combining a non-metallic continuous filament yarn with the blended yarn; to form a composite yarn; and
   c. removing said non-metallic staple fibers while leaving said metallic staple fibers trapped in said composite.

3,882,668
ALARM CLOCK TIMER

Robert L. Boyles, Wayland, Mass., assignor to General Electric Company, Bridgeport, Conn.

Filed Aug. 16, 1973, Ser. No. 388,770
Int. Cl. G04b *25/00*
U.S. Cl. 58—22 **8 Claims**

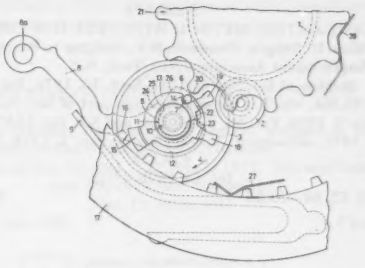


1. An alarm clock mechanism comprising:
   a. a timing mechanism;
   b. a supporting structure;
   c. a member for sounding an alarm connected to said supporting structure and movable to an alarm on or an alarm off position;
   d. an elongated alarm control lever mounted on said supporting structure and movable into engagement with said member for shutting off the alarm, said elongated alarm control lever having a central portion and two end portions;
   e. spring means connected to said elongated alarm control lever for urging said lever to a first alarm position;
   f. a latch integrally formed on said alarm control lever for holding said alarm control lever in the other alarm position;
   g. said alarm control lever being mounted for longitudinal movement to move said member to an alarm sounding position or an alarm off position, said alarm control lever being mounted for tilting movement, and said alarm control lever being mounted for transverse movement;
   h. a first cam means driven by said timing mechanism in selective engagement with an end portion of said alarm control lever for moving said lever transversely at a preset time to disengage said latch to permit said elongated alarm control lever to move longitudinally under the force of said spring means to move said member to said first alarm position at a preset time; and
   i. a second cam means driven by said timing mechanism in selective engagement with the central portion of said alarm control lever for tilting said alarm control lever into engagement with said first cam means a short time prior to said preset time.

3,882,669
DEVICE FOR DRIVING DAY AND DATE INDICATORS IN A WRIST-WATCH

Edwin Jakob, Grenchen, Switzerland, assignor to ETA Ebauches Fabrik, Grenchen, Switzerland

Filed May 29, 1974, Ser. No. 474,348
Claims priority, application Switzerland, June 5, 1973, 8141/73
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **6 Claims**

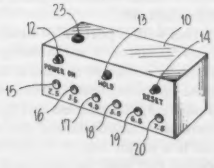


1. A watch including day and date indicators, and a device for driving the day and date indicators, comprising a calendar-wheel for rotating at the rate of one revolution every 24 hours, a cam coupled to the calendar-wheel in such a way as to be able to rotate freely with respect to the said wheel through a certain angle, and a control member cooperating with an incline of said cam for causing the cam to shift by rotating abruptly through said angle, wherein the control member comprises a shifting element which cooperates with the incline of the cam, and a banking element separate from said shifting element, the shifting element describing during the shift a path passing beyond the point of rotation of the cam, while the banking element strikes against a concentric portion of the cam at the conclusion of the shift, and a shifting member which is coupled rigidly to the cam and has a drive element for the date indicator and at least one drive element for the day indicator.

3,882,670
TELEPHONE TIMER

Robert E. Woolley, Alameda, Calif., assignor to Linda Bradbury, San Francisco, Calif.

Filed Aug. 6, 1973, Ser. No. 385,771
Int. Cl. G04b *5/20;* **G04f** *3/06*
U.S. Cl. 58—145 K **11 Claims**



1. A telephone timing and display unit for providing an indication of a final interval of predetermined duration of

each of a number of toll charge intervals during a telephone call, said unit comprising:

clock means for providing a reference clock signal train;

means for generating a succession of final interval signals of predetermined duration from said reference clock signal train, each succeeding final interval signal beginning a fixed time interval after the end of the previous final interval signal;

manually actuatable means for initializing said generating means at the beginning of said telephone call;

a plurality of display lamps, each for specifying a different one of said final intervals; and

means for energizing a different one of said lamps at a rate related to said clock signal train for each of said final intervals in response to the generation of each of said final interval signals so that each of said lamps is intermittently energized only during the final portion of a different toll charge interval.

3,882,671

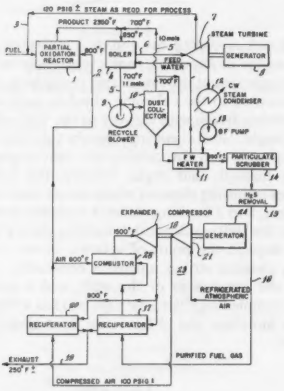
GASIFICATION METHOD WITH FUEL GAS COOLING

William H. Nebgen, Woodside, N.Y., assignor to Brayton Cycle Improvement Associaton, New York, N.Y.

Division of Ser. No. 180,282, Sept. 14, 1971, Pat. No. 3,788,066, which is a continuation-in-part of Ser. No. 34,717, May 5, 1970, Pat. No. 3,668,884, and Ser. No. 44,673, June 9, 1970, abandoned. This application Jan. 2, 1974, Ser. No. 429,531

Int. Cl. F02b *43/12*

U.S. Cl. 60—39.02 **6 Claims**



1. In a Brayton cycle including air compression, combustion, and combustion gas expansion in an expander, such as a gas turbine, the improvement which includes, in combustion,

a. heating the compressed air,

b. gasifying dirty fuel with a portion of heated compressed air, said fuel on gasification comprising contaminants which are chemically corrosive to steel at temperatures at least as low as the operating temperature of the expander,

c. cooling and purifying the gasified fuel by removing said chemically corrosive contaminants, the cooling being effected at least in a major degree by mixing a portion of the cooled gasified fuel with the uncooled gasified fuel,

d. combusting the thus purified gasified fuel with a second portion of the heated compressed air, and

e. expanding the products of combustion in the expander.

3,882,672

SYSTEM ARRANGEMENT FOR GOVERNING GAS TURBINE ENGINES, ESPECIALLY GAS TURBINE AERO-ENGINES

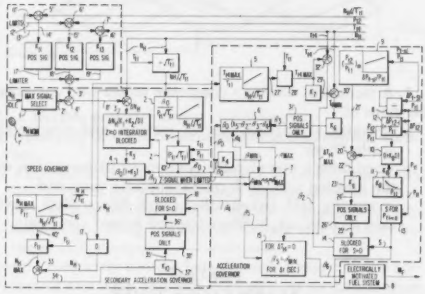
Klaus Bauerfeind, Munich, Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Munich, Germany

Filed Feb. 5, 1973, Ser. No. 329,314

Claims priority, application Germany, Feb. 5, 1972, 2205445

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 R **30 Claims**



1. System arrangement for the control of acceleration processes in gas turbine engines, especially gas turbine aero engines of the type having a compressor operating in front of a combustion chamber and a turbine operating behind the combustion chamber, the system arrangement comprising means for measuring the actual ratio of pressures at the outlet and inlet of the compressor and providing output signal values indicative thereof, means for comparing the actual measured compressor pressure ratio signal values with a set of predetermined pressure ratio signal values for an operating range of the engine which predetermined pressure ratio signal values are set below the ratio level signal value corresponding to compressor surge over the operating range of the engine, and means responsive to the actual measured signal value of the compressor ratio exceeding the predetermined pressure ratio signal value for controlling the metered fuel value β from a speed governor of the engine to provide a maximum value of β_{max} during acceleration and to provide a minimum value of β_{min} during deceleration of the engine.

3,882,673

METHOD OF USING LIQUID OXIDANTS TO OBTAIN PURIFIED GASES FROM SOLID PROPELLANTS

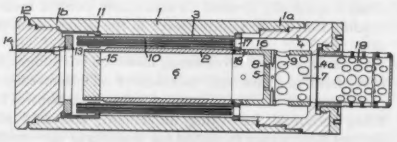
Bernard Doin, and Bernard Plantif, both of Saint-Medard-en-Jalles, France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 6, 1971, Ser. No. 205,046

Claims priority, application France, Dec. 11, 1970, 70.44838

Int. Cl. C06d *5/06, 5/08;* B60n

U.S. Cl. 60—207 **5 Claims**



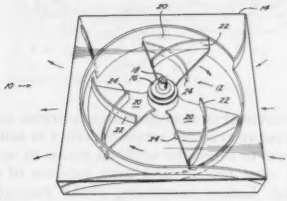
1. A method of obtaining the release of a large amount of purified gases at a moderate temperature in an extremely short time, wherein a solid propellant is burned and the gases resulting from this combustion are placed in contact with a

vaporisable cooling liquid, said liquid being an oxidizing compound which is an aqueous solution of hydrogen peroxide, potassium permanganate or potassium nitrate so as simultaneously to oxidize at least a substantial proportion toxic substances present in the combustion gases and cause purification of the said combustion gases by oxidation of the noxious ingredients in these gases into non-harmful products at high temperature and pressure, and cooling of these gases by mixing with the said liquid and vaporisation of the latter.

3,882,674
VORTEX PROPELLER

Robert Taggart, 3930 Walnut, Fairfax, Va. 22030

Filed May 24, 1973, Ser. No. 363,375
Int. Cl. B63h *11/02*
U.S. Cl. 60—221 **16 Claims**



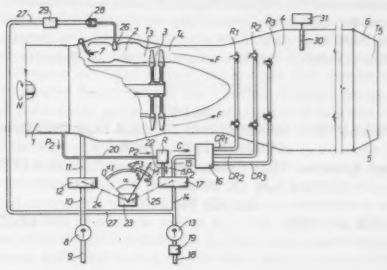
1. A propulsion unit for operation in a fluid comprising,
a cylindrical housing having a first axis,
a propeller in said housing mounted for rotation about said first axis,
inlet means in said housing for the generally radial flow of fluid into the propeller from the periphery of the propeller, and
outlet means in said housing for the flow of fluid peripherally out of the propeller,
said inlet and outlet means being located on opposite sides of the housing,
said propeller further including fluid acceleration means for acceleration of the fluid radially inwardly as it flows into the propeller, axially of the propeller and radially outwardly as it flows out of the propeller.

3,882,675
DEVICE FOR PROGRAMMING THE AFTERBURNING-INITIATION PHASE IN A TURBOJET ENGINE

Pierre Michel Andre Galmiche, Le Mee-sur-Seine; Henri Jacques Jourdier, Moissy-Cramayel, and Pierre Paul Louis Odeyer, Paris, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Feb. 16, 1973, Ser. No. 333,371
Claims priority, application France, Feb. 18, 1972, 72.05566
Int. Cl. F02k *3/10*
U.S. Cl. 60—243 **16 Claims**

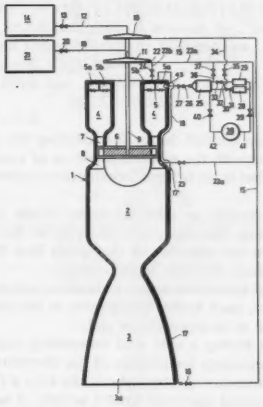
1. In and for a turbojet engine comprising a compressor, an afterburning duct, means for supplying said afterburning duct with fuel, and means for metering the flow of fuel injected into said duct, said flow-metering means being sensitive to a parameter βP_2, in which P_2 is a characteristic working pressure of said compressor, and β is a coefficient which is lower than, or at most equal to one, in combination, a device for programming the afterburning-initiation phase comprising, means for modifying said coefficient β to temporarily reduce said coefficient β during the afterburning-initiation phase, and means for automatically disabling said β-modifying means after the moment at which ignition of the fuel has actually been obtained in the afterburning duct.



3,882,676
MAIN STREAM LIQUID-FUEL ROCKET ENGINE CONSTRUCTION

Gunther Schmidt, Unterhaching, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Germany

Division of Ser. No. 302,772, Nov. 1, 1972. This application Apr. 19, 1974, Ser. No. 462,531
Int. Cl. F02k *9/02*
U.S. Cl. 60—245 **6 Claims**



1. A liquid-fuel rocket engine comprising wall means defining a precombustion chamber and a main combustion chamber having a thrust nozzle with a thrust discharge with gas passage means therebetween, a turbine having blades disposed in said gas passage means and being rotatable by said gas passing therethrough, propellant pump means connected to said turbine for rotation thereby for pumping at least two separate propellant components, means defining an ignition chamber adjacent said precombustion chamber having a connection to said precombustion chamber for discharging gases thereto, means for regulating the flow of gases from said ignition chamber to said precombustion chamber, gas pressure operated propellant component supply means for supplying at least two separate propellant components under pressure to said ignition chamber for ignition therein to generate heating gases, means for selectively connecting a propellant component from said propellant component pump means to

said ignition chamber, to said precombustion chamber, and to said combustion chamber for separately supplying a propellant component to said precombustion chamber, said ignition chamber, and directly into said main combustion chamber and means for selectively connecting another propellant component from said propellant component pump means to said ignition chamber and to said precombustion chamber.

3,882,677

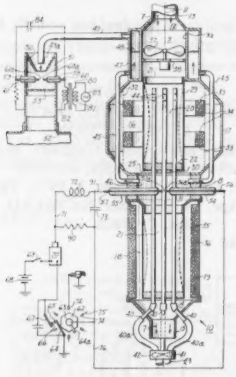
POLLUTION MINIMIZING DEVICE FOR INTERNAL COMBUSTION ENGINES

Hrant Eknayan, 7528 Columbia, Rosemead, Calif. 91770

Filed July 25, 1973, Ser. No. 382,373

Int. Cl. F01n *3/14*

U.S. Cl. 60—298 **11 Claims**



1. A pollution control device for reducing the quantity of pollutant mixed with the gaseous products of combustion of hydrocarbon fuel in an internal combustion engine, comprising:

a chamber having an inlet for entry of the combustion products into the chamber and an outlet for exhaust of gases from the chamber so that gases flow through the chamber from the inlet to the outlet;

a plurality of baskets arranged in tandem and spaced from each other, each basket being open at its upstream end and closed at its downstream end;

each basket having a side wall comprising copper which provides openings for passage of gas therethrough;

means for introducing atmospheric air into a first of said baskets located upstream from a second of said baskets;

means comprising spaced electrodes forming a spark gap located in the region between said first and second baskets; and

means producing intermittent sparks across said gap.

3,882,678

AUTOMATIC CONNECTING VALVES FOR RESERVE PUMPS

Rolf Fassbender, Mutlangen, Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Postfach, Germany

Filed June 5, 1974, Ser. No. 476,432

Claims priority, application Germany, June 8, 1973, 2329328

Int. Cl. F15b *20/00*

U.S. Cl. 60—405 **12 Claims**

1. A valve for controlling main flow from a main pump and reserve flow from a reserve pump, to a consumer unit;

comprising a housing having a main pump inlet and a reserve pump inlet;

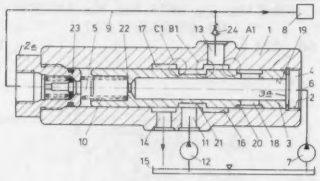
said valve having passage means for a pilot stream and main flow from said main pump;

outlet means for main flow from said main pump and reserve flow from said reserve pump to a consumer unit;

actuable valve means in said housing;

said valve means and said housing having coacting elements relatively positionable to open main flow to said outlet means and close reserve flow or to close main flow and open reserve flow to said outlet means;

bias means normally biasing said valve means to close main flow and open reserve flow to said outlet means;



pressure differential means comprising upstream and downstream pressure chamber means operative to actuate said valve means to overcome said bias means to open main flow and close reserve flow upon increase of pressure differential; further comprising choke passage means operable to pass said pilot stream from said upstream to said downstream pressure chamber means; and a connection from said downstream pressure chamber means to said outlet means whereby a reduction in pressure differential to a predetermined value permits said bias means to actuate said valve means to effect reserve flow to said consumer unit.

3,882,679

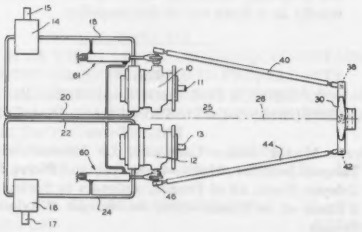
CONTROL FOR DUAL PATH HYDROSTATIC DRIVE

William Aplin Williamson, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 28, 1974, Ser. No. 446,998

Int. Cl. F16h *39/46*

U.S. Cl. 60—484 **9 Claims**



1. A control mechanism for a dual path hydrostatic drive system having two variable displacement swash plate type pumps connected individually in circuit with two motors, comprising a single vertically disposed control lever pivotable about a horizontally disposed axis and about a vertically disposed axis, a transverse portion rigidly secured to the said control lever and extending outwardly relative to the said vertically disposed axis, a pair of operating rods connected between the said transverse portion and the swash plates of the respective pumps, and a pair of hydraulic power assist devices mechanically connected respectively to the swash plates, each of said devices having hydraulic connections to the pressure and suction chambers of its respective pump and

arranged to apply a force to the swash plate of its respective pump which is additive to the force applied by the respective operating rod when the swash plate is in other than its neutral condition.

3,882,680

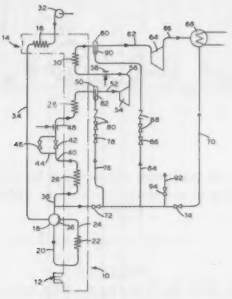
BY-PASS SYSTEM

Oliver W. Durrant, and Kurt H. Haller, both of Akron, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 18, 1972, Ser. No. 245,214

Int. Cl. F01k *13/02*

U.S. Cl. 60—646 **4 Claims**



1. In a power plant system having vapor generating means, turbine means flow connected therewith, vapor superheating means flow connectedly interposed between the generating and turbine means, and condenser means disposed in flow receiving relation with the turbine means, the improvement comprising conduit means by-passing said superheating and turbine means, valve means for adjusting the vapor flow through the superheating and conduit means, said conduit means including means for admixing at least a portion of the by-passed vapor with the superheated vapor to maintain the vapor temperature entering the turbine means within a given limit, and means for discharging the remaining by-passed vapor into the condenser means.

3,882,681

EXHAUST INSTALLATION FOR A ROTARY PISTON INTERNAL COMBUSTION ENGINE

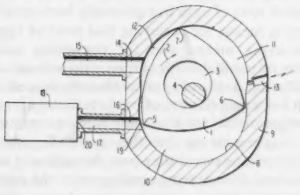
Karl-Walter Schmidt, Beutelsbach, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 27, 1972, Ser. No. 309,916

Claims priority, application Germany, Nov. 27, 1971, 2158963

Int. Cl. F02b *53/00*

U.S. Cl. 60—901 **12 Claims**



1. An exhaust installation for a rotary piston internal combustion engine having at least one disk, each disk having polygonal piston means rotating within a housing means provided with internal trochoidal running surface means, each polygonal piston means including spaced corner portions sliding along said internal trochoidal surface means, and working chamber means formed between the housing means and the respective corner portions of said polygonal piston means, one inlet channel means and one exhaust channel means being provided in the housing means for each disk, the installation comprising: an exhaust pipe means being connected to a respective exhaust channel means, at least one reflection surface means provided in said exhaust gas pipe means at a predetermined distance from the working chamber means to reflect the exhaust gases, the exhaust channel means and said exhaust pipe means having a predetermined cross section to cause the flow of exhaust gases therein at nearly the speed of sound at substantially full load and at approximately maximum rotational speed of the engine, the length of said exhaust channel means and said exhaust pipe means constituting said predetermined distance to said at least one reflection surface means, whereby, at substantially full load and approximately maximum rotational speed, one of the corner portions of the polygonal piston means sliding along said internal trochoidal running surface means slides past the beginning of said exhaust channel means and releases the exhaust gases from said working chamber means into said exhaust channel means creating a pressure front travelling in the exhaust gases at substantially the speed of sound relative to the flowing exhaust gases, said pressure front starts travelling from the beginning of the exhaust channel means within the same and within said exhaust pipe means and reaches after reflection at said reflection surface means the beginning of the exhaust channel means of a disk at the instant at which said one of the corner portions of the polygonal piston means slides past the beginning of said inlet channel means in said last-mentioned disk.

3,882,682

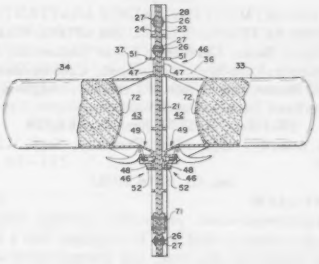
FLOATING BOOM WITH DEMOUNTABLE FLOATS

Harold R. Appelblom, 2310 Carlmont Dr., Belmont, Calif. 94002, and Francois Emile de Bourguignon, 1269 Ridgeley Dr., Campbell, Calif. 95008

Filed Apr. 16, 1973, Ser. No. 351,519

Int. Cl. E02b *15/04*

U.S. Cl. 61—1 F **7 Claims**



1. In a floating boom having a sheet-like partition means and a plurality of float means demountably secured to said partition means at relatively spaced intervals thereon, said float means including a frame member engaging said partition means, a pair of arms mounted to said frame member and extending outwardly therefrom to positions on each side of said partition means, and a float element mounted to each of said arms at a spaced distance from said partition means to define a passageway between said float element and said partition means, the improvement comprising:

said frame member being relatively permanently mounted in engagement with said partition means; and

said float means further including coupling means formed as interengaging and mating cleats formed on said frame and foot portions formed on said arms and latch means formed to selectively lock said foot portions and said cleats in interengagement, whereby selective coupling

and uncoupling of said float elements to said frame member can be achieved.

3,882,683

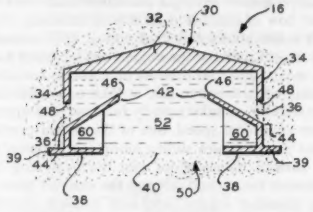
DRAIN EXTENSION

Robert M. Purcell, 22 Ronald Ln., Sayville, N.Y. 11782

Filed July 30, 1973, Ser. No. 384,027

Int. Cl. E02b *13/00*

U.S. Cl. 61—13 **9 Claims**



1. A drainage arrangement including drain means, said drain means comprising:

a first side wall of predetermined height and length;

a second side wall of predetermined height and length disposed opposed to and spaced from said first side wall;

said side walls having upper, lower and edge extremeties;

surface means interconnecting said first side wall and said second side wall proximate said upper extremeties thereof so as to form therewith a substantially U-shaped channel like member;

at least one aperture extending through at least one of said side walls; and

louver like means extending inwardly and upwardly from the lower edge of said aperture, into said channel like member, and terminating spaced from said side wall at a level above the level of the upper edge of said aperture.

3,882,684

TWO-COMPARTMENT CARTRIDGE ADAPTED FOR USE IN STRENGTHENING COAL OR STONE WALLS

Frank Meyer, Essen, Germany; Alfons Jankowski, Mauren, Liechtenstein; Otto-Ernst Glaesmann, Castrop-Rauxel, and Gerhard Haake, Essen, both of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed Sept. 9, 1974, Ser. No. 504,538

Claims priority, application Germany, Sept. 12, 1973, 2345913

Int. Cl. E21d *20/02*

U.S. Cl. 61—45 B **9 Claims**

1. A two-compartment pierceable cartridge adapted for reinforcing a stone or coal wall by insertion into a hole that had been bored into the wall, one compartment of which contains a polyisocyanate of diphenylmethane and the other compartment of which contains a mixture of a polyetherglycol having a hydroxyl number between 200 and 400, between 10 and 20 percent by weight of a plasticizer, and between 0.3 and 5.0 percent by weight of water.

3,882,685

METHOD OF AND APPARATUS FOR THE LOW-TEMPERATURE LIQUEFIED GAS

Rudolf Becker, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 17, 1973, Ser. No. 425,131

Claims priority, application Germany, Dec. 22, 1972, 2263063; Nov. 12, 1973, 2356395

Int. Cl. F17c *7/02*

U.S. Cl. 62—55 **10 Claims**

1. In the transport of a liquefied gas at a temperature below its boiling point in an insulated cargo compartment of a conveyance having a plurality of upright vertically elongated storage vessels disposed in said compartment with a horizontally extending receptacle overlying said vessels, connected thereto by a riser tube and in heat-exchanging relationship with ambient gases around upper portions of said vessels between a location in which the liquefied gas is loaded into said vessels and at a location at which the liquefied gas is discharged from the vessels, the improvement which comprises the following steps:

a. maintaining in said vessels a level of said liquefied gas above the base of said vertically elongated storage vessels to cool the vessels to preclude the necessity of recooling of the vessels when the vessels are to be charged with the liquefied gas at the filling station;

b. filling the vertically elongated storage vessels from said level to their tops and filling the horizontally extending receptacle overlying said vessels to a location at an intermediate distance between the bottom and the top of said horizontal receptacle with the liquefied gas to form a liquid-gas interface at said location; and

c. maintaining the level of the liquid-interface in the horizontal receptacle substantially at said location to insure an adequate amount of the liquefied gas is available in said horizontal receptacle to effect heat exchange with said vertically elongated storage vessels by vaporization of the liquid-gas interface.

3,882,686

METHOD AND APPARATUS FOR COOLING EGGS

Boyd W. Rose, 5413 Granada St., Riverside, Calif. 92504

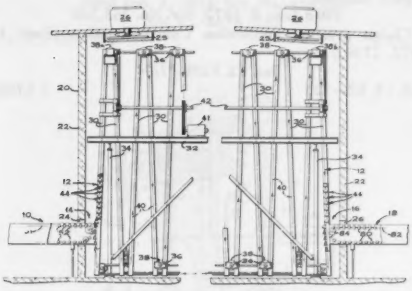
Continuation of Ser. No. 205,154, Dec. 6, 1971, abandoned. Filed Dec. 26, 1973, Ser. No. 427,741

Int. Cl. F25d *13/06*

U.S. Cl. 62—63 **19 Claims**

1. Apparatus for cooling eggs comprising first conveying means comprising a series of uniformly spaced rollers for conveying spaced rows of eggs in a generally horizontal plane, second conveying means for receiving said rows of eggs from said first conveying means and for conveying said eggs through a series of parallel vertical runs, said second conveying means including a plurality of uniformly spaced carrier members each having a plurality of pockets therein for receiving a row of eggs, means for mounting said carrier members to said conveying means so that they generally maintain a constant spacial orientation as they pass through said series of parallel runs, means for applying cooling air to the eggs while they are carried by said second conveying means, third conveying means comprising a series of uniformly spaced rollers for receiving said rows of eggs from said second conveying means and for conveying said eggs in a generally horizontal plane, means for gently delivering each row of eggs from said first conveying means to one of said carrier members of said

second conveying means while said carrier member is moving vertically upwardly, and means for gently delivering said row



of eggs from each of said carrier members to said third conveying means while said carrier member is moving vertically downwardly.

3,882,687

METHOD OF AND APPARATUS FOR THE COOLING OF AN OBJECT

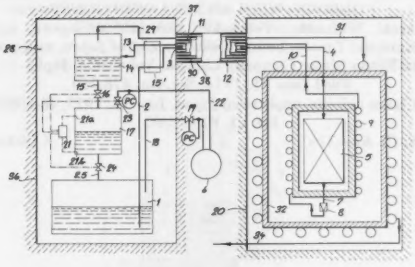
Stefan Asztalos, Munich; Rudolf Kneuer, Walchstadt, Icking; Alfred Stephan, and Reinhard Glatthaar, both of Munich, all of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Jan. 23, 1974, Ser. No. 435,856

Claims priority, application Germany, Jan. 25, 1973, 2303663

Int. Cl. F25d *17/02*

U.S. Cl. 62—64 **12 Claims**



1. A method of cooling an object to be maintained at a cryogenic temperature comprising the steps of: continuously feeding a liquid cryogen from a supply vessel to said object; maintaining a pressure in said vessel sufficient to displace said liquid cryogen to said object; expanding liquid cryogen upon its passage to said object to form a vapor/liquid phase mixture of the liquid cryogen; separating said phase mixture into a liquid phase and a vapor phase in a second vessel; transferring the liquid phase from said second vessel directly to a third storage vessel; and at least intermittently feeding said liquid cryogen from said storage vessel to said supply vessel upon the liquid level in said storage vessel attaining a predetermined height and at substantially the pressure in said supply vessel.

3,882,688

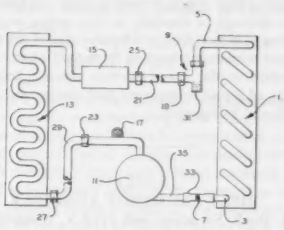
CONNECTING APPARATUS AND METHOD FOR A PRECHARGED REFRIGERATION SYSTEM

Fred V. Honnold, Jr., North Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed June 1, 1973, Ser. No. 366,226

Int. Cl. F25b *45/00*

U.S. Cl. 62—77 **2 Claims**



1. A method for connecting a refrigerant-charged condenser portion of a compression refrigeration system to the balance of the system, the condenser portion having an outlet line with a fusible sealing plug mounted therein and an inlet line with a valve for selectively opening and closing the inlet line to refrigerant flow, and the balance of the refrigeration system having corresponding inlet and outlet lines and being substantially devoid of condensible contaminants, to establish a refrigerant circuit, said method comprising the steps of:

a. connecting the inlet and outlet lines of said condenser portion with the corresponding inlet and outlet lines of the balance of the refrigeration system;

b. opening the valve in the inlet line to the condenser portion to equalize the refrigerant pressure across the fusible plug; and

c. applying heat to the outlet line from the condenser portion to melt the fusible plug and to thereby establish a refrigerant circuit in the refrigeration system.

3,882,689

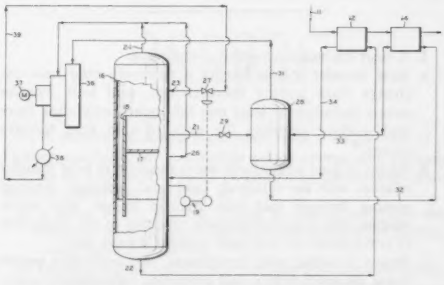
FLASHING LIQUID REFRIGERANT AND ACCUMULATING UNVAPORIZED PORTIONS AT DIFFERENT LEVELS OF A SINGLE VESSEL

Ronald S. Rogers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 27, 1972, Ser. No. 318,707

Int. Cl. F25b *1/00*

U.S. Cl. 62—115 **10 Claims**



1. A refrigeration method comprising the steps of:

a. flashing a liquid refrigerant into the upper portion of an enclosed chamber thereby vaporizing a portion of said refrigerant;

b. accumulating unvaporized liquid refrigerant at an intermediate level in said chamber thereby establishing a first body of liquid refrigerant in said chamber;

c. flowing accumulated unvaporized liquid from a level above said intermediate level to a lower level in said chamber, thereby limiting the maximum level of said first body of liquid refrigerant and establishing a second body of liquid refrigerant at said lower level;

d. utilizing liquid from said first body and said second body of liquid refrigerant in separate refrigeration stages at different pressures;

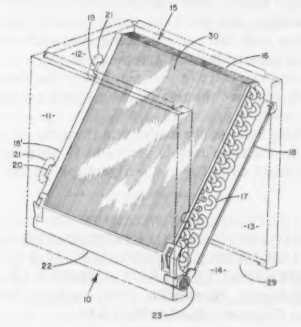
wherein a first vapor stream is removed from said chamber through a conduit in the upper portion thereof above said first body of liquid refrigerant and a second vapor stream is removed from said chamber through a conduit in the lower portion thereof below said first body of liquid refrigerant and above said second body of liquid refrigerant.

3,882,690

HEAT EXCHANGE ASSEMBLY

Richard J. Duell, Syracuse, and Fred V. Honnold, Jr., North Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,733
Int. Cl. F25d *21/14*
U.S. Cl. 62—288 **6 Claims**



1. A heat exchange assembly comprising:

a. heat transfer means having a relatively cold heat exchange fluid passing therethrough, said heat transfer means including at least one tab means extending from each surface defining the ends of said heat transfer means;

b. means to pass a relatively warm medium in heat transfer relation with the relatively cold heat exchange medium passing through said heat transfer means, said warm medium being cooled thereby resulting in the formation of condensate on said heat transfer means; and

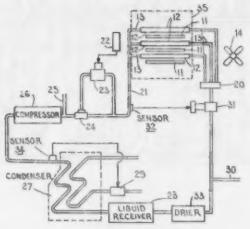
c. means to collect said condensate, said collection means being disposed below and extending substantially coextensive with the lower surface of said heat transfer means to permit said condensate to drain into said collection means, said collection means including means defining a slot at each end thereof, each of said slot defining means receiving one of said tab means extending from said heat transfer means to secure said collection means to said heat transfer means.

3,882,691

APPARATUS FOR COOLING ELECTRICAL CIRCUIT COMPONENTS

Donald Baines, and Godfrey Roger Houseman, both of Stockport, England

Filed June 8, 1972, Ser. No. 263,346
Claims priority, application United Kingdom, June 10, 1971, 27363/71
Int. Cl. F25b *41/04*
U.S. Cl. 62—225 **5 Claims**



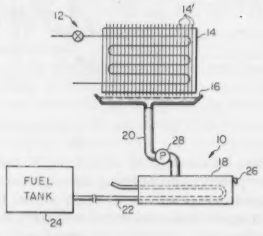
1. An electrical circuit arrangement comprising: a support member; a plurality of electrical components mounted on a support surface of said support member; a cooling member positioned adjacent to and spaced from said components, said cooling member having a cooling surface which faces said support surface; means for maintaining said cooling member at a temperature lower than a desired operational temperature of the components; means for producing a turbulent flow of gas between said surfaces thereby promoting convective transfer of heat from said components to said cooling surface; and means for controlling the rate of absorbtion of heat by said cooling means such that the temperature of the gas after passing between said surfaces is substantially the same as the temperature of the gas before passing between said surfaces.

3,882,692

FUEL COOLING DEVICE IN AN AUTOMOTIVE VEHICLE EQUIPPED WITH AN AIR CONDITIONER

Takeaki Watanabe, Yokosuka; Hiroshi Sakasegawa, and Kuniyuki Tanabe, both of Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed June 11, 1974, Ser. No. 478,260
Claims priority, application Japan, June 13, 1973, 48-69882
Int. Cl. F28d *5/00*
U.S. Cl. 62—316 **5 Claims**

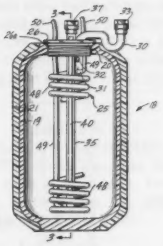


1. A fuel cooling device in an automotive vehicle equipped with an air conditioner including a refrigerant evaporator, comprising a heat exchanger disposed in contact with fuel for cooling thereof; conduit means fluidly connecting a reservoir and said heat exchanger; said reservoir being disposed to collect cool condensed water from the refrigerant evaporator.

3,882,693
WATER COOLER

Donald E. Hiller, Santa Barbara, Calif., assignor to Rayne International, Santa Barbara, Calif.

Filed Feb. 1, 1974, Ser. No. 438,869
Int. Cl. B67d *5/62*
U.S. Cl. 62—394 **6 Claims**

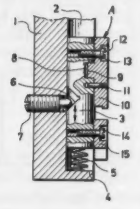


1. A water cooler comprising:
a container for receiving water to be chilled; and
a double-tube cooling coil supported within the container to be immersed in the water to be chilled, the coil being helically wound and having an inner tube to receive a refrigerant fluid, and an outer tube which isolates the inner tube from water in the container to prevent water contamination should the inner tube fail, the outer tube having an open end venting outside the container, the inner and outer tubes having substantially uniform wall thicknesses and having cross-sections deformed into generally elliptical shape by the helical winding to place a portion of an outer surface of the inner tube in contact with a portion of an inner surface of the outer tube along the length of the helical coil.

3,882,694
ADJUSTABLE NEEDLE CAM SUPPORT

Bohumil Stepanek, and Rudolf Bandoch, both of Brno, Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Mar. 14, 1973, Ser. No. 341,036
Int. Cl. D04b *15/32*
U.S. Cl. 66—54 **5 Claims**



1. A supporting device for the needle cams on knitting machines, comprising a supporting frame member, a slide mounted on the frame member for adjustment along a first path parallel to the direction of knitting movement of the knitting needles, means for adjusting the slide along the said first path, a stitch cam and means connecting the stitch cam to the slide for sliding movement with respect thereto along a second path transverse to the direction of the knitting movement of the knitting needles, said last named means comprising interfitting relatively laterally slidable guiding tongue and horizontally groove formations on the slide and stitch cam, said formations extending transversely to the direction of knitting movement of the knitting needles, and means for securing the stitch cam to the slide in a selected position along said second path.

3,882,695
WEAR-RESISTANCE OF KNITTING MACHINE SUPPORT MEMBERS

Howard D. Flicker, Miami, Fla., assignor to The Singer Company, New York, N.Y.

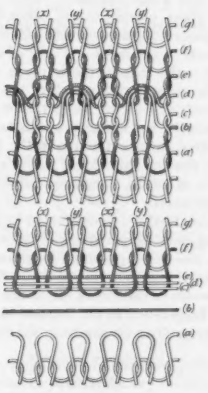
Filed Nov. 5, 1973, Ser. No. 413,018
Int. Cl. B04b *15/00*
U.S. Cl. 66—115 **19 Claims**

1. A needle cylinder for a circular knitting machine having a plurality of needle accomodating slots therein, the needle-bearing base of each of said slots being provided with a wear-resistant non-ferrous metal coating comprising nickel phosphide which exhibits a Rockwell C-scale hardness of at least 70 and is of substantially uniform thickness of at least 0.002 inches, said coating being bonded to the substrate by means of a network of interstices in the surface thereof.

3,882,696
METHOD OF KNITTING

Keith Jeffcoat, Nuneaton, and Robert Scott, Gilmorton near Rugby, both of England, assignors to Courtaulds Limited, London, England

Continuation of Ser. No. 197,288, Nov. 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 33,375, April 30, 1970, abandoned. This application Aug. 31, 1973, Ser. No. 393,280
Int. Cl. D04b *9/46*
U.S. Cl. 66—172 R **7 Claims**



1. A method of knitting on needles of a single bed of a knitting machine, an unroveable set-up comprising starting courses for a piece of fabric to be knitted on the machine, said method comprising the steps of
a. knitting a first starting course by taking yarn into the hooks of all of said needles and holding said first starting course against unroving,
b. knitting at least one subsequent starting course by taking yarn into the hooks of all of said needles, pulling alternate loops of said subsequent starting course through alternate loops of said first starting course and retaining the remaining loops of said subsequent starting course on the needles with the remaining loops of said first starting course,
c. knitting a final starting course by taking yarn into the hooks of all of said needles, and pulling alternate loops of

said final starting course through said retained loops of the previous courses, and

d. releasing said hold on the first starting course, leaving at least said first final starting courses interlaced, thus to prevent unroving of said final starting course.

3,882,697

KNITTING OF GARMENTS

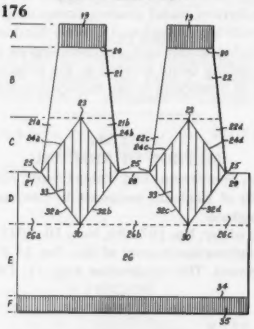
Max William Betts, Coventry, and Frank Robinson, Borrowash, both of England

Continuation-in-part of Ser. No. 126,521, March 22, 1971, abandoned. This application Dec. 6, 1972, Ser. No. 312,710

Claims priority, application United Kingdom, Dec. 7, 1971, 56765/71

Int. Cl. A41b *9/06*

U.S. Cl. 66—176 **22 Claims**



1. A method of knitting a blank for production of a garment having sleeves and a body portion with a waist and a neck, comprising the steps, carried out in either order, of

a. knitting a piece of non-tubular fabric comprising substantially all parts of the front and rear of the body portions, so that the wales in said fabric piece run in a direction between the waist and the neck of the garment and

b. forming both sleeves for the garment substantially contemporaneously by knitting non-tubular sleeve fabric having knitted wales extending in the longitudinal direction of the sleeves, said sleeve fabric including pieces of fabric each of which comprises substantially the whole fabric for a sleeve,

said method being further characterized by taking needles out of action, during knitting, progressively along one sleeve-body join line whilst maintaining knitted loops on said needles and then progressively reintroducing said needles to knitting action, whereby wales of the sleeve fabric are joined at an angle to wales of the body fabric in the finished blank and the sleeve fabric is knit integrally with the body fabric.

3,882,698

FLEXIBLE DYE TUBE

Stanley Livingstone, Charlotte, and Neal E. Sellers, Mount Holly, both of N.C., assignors to American & Efird Thread Mills, Inc., Mount Holly, N.C.

Filed June 27, 1973, Ser. No. 373,982

Int. Cl. B65h *75/22*; **B05c** *7/00*

U.S. Cl. 68—198 **10 Claims**

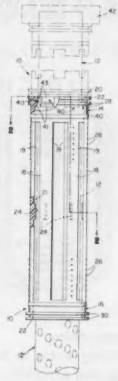
1. A tube for use on a perforated dyeing spindle, for supporting for dyeing a package of yarn wound therearound, said tube having a longitudinal axis and comprising:

a plurality of flexible uprights spaced circumferentially around said axis, and

top and bottom base portions of the tube,

each said upright being joined at opposite ends to said base portions, respectively, and unsupported between said base portions, said uprights being sufficiently resilient so that they will bow under radially compressive forces and recover their original shape upon removal of said forces,

each said upright having an inner surface and a portion protruding from said inner surface toward said axis, to prevent contact of said upright with said spindle except at said portion of said upright, thus minimizing blockage of



the perforations in said spindle by said uprights and limiting the area of contact between said spindle and said uprights upon shrinkage of said yarn,

said spaced uprights and base portions cooperatively defining a plurality of dye openings through the tube.

3,882,699

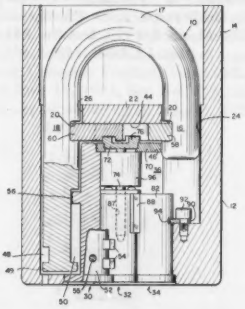
ATTACK-RESISTANT PADLOCK

Max L. Flack; William R. Foshee, and Ralph E. Le Tourneau, all of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Filed July 23, 1973, Ser. No. 381,925

Int. Cl. E05b *67/22*

U.S. Cl. 70—38 A **15 Claims**



1. A padlock, comprising

a case having two parallel holes for reception of the spaced legs of a shackle, and a transverse bolt slideway extending between and intersecting said holes,

a shackle receivable in said holes and having bolt-receiving notches in its legs,

a pair of L-shaped bolts longitudinally slidable in said slideway between projected and retracted positions,

said bolts having head ends which in said projected position extend into said shackle notches to secure the shackle against retraction from the case,

said bolts having inward projecting legs lying on opposite sides of an interface plane in passing side-by-side relation-

ship, the legs having transverse slots therein for engagement by a throw member,

a throw member rotatably mounted in said case on an axis substantially in said interface plane and having eccentric drive lugs thereon engaged in said bolt slots,

said lugs each having an external surface on an arc about the center of rotation of the throw member and being movable substantially to a position intersecting said interface plane, the bolt slots having outer side faces substantially normal to said interface plane and tangent to said external lug surfaces when the throw member and bolts are in bolt projected position so as substantially to deadlock said bolts against forced retraction.

3,882,700

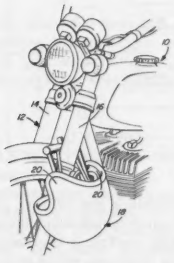
HELMENT LOCK FOR MOTORCYCLES

Weldon C. Dunlap, 5780 Gena Ln., and Thomas R. Philips, 215 Berkshire Ln., both of Beaumont, Tex. 77707

Filed Feb. 1, 1974, Ser. No. 438,798

Int. Cl. E05b *69/00*

U.S. Cl. 70—59 **9 Claims**



1. A helmet lock comprising a generally U-shaped body including generally parallel legs interconnected at one pair of corresponding ends by means of an elongated bight portion assembly extending and secured therebetween, the free end portions of the legs of said U-shaped body including oppositely outwardly facing and projecting abutment members adapted to engage the inner surface portions of the portions of a safety helmet covering the ears of the wearer of the helmet, said bight portion assembly including opposite end sections thereof from which the corresponding legs are supported, said end sections being guidingly supported from each other for adjustment of said legs toward and away from each other and including coacting lock means operable to releasably lock said end sections in adjusted relative positions against relative adjustment thereof to shift said legs toward each other.

3,882,701

LOCKING LATCH FOR A DISK CARTRIDGE

Wayne M. Wirth, North Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 28, 1973, Ser. No. 419,711

Int. Cl. E05b *65/48*

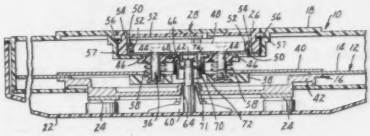
U.S. Cl. 70—63 **4 Claims**

1. A cartridge for a recording disk having a hub with a central opening, said cartridge including separable mating top and bottom covers coupled by a releasable catch mechanism operable by a handle mounted on the top cover for movement between open and closed positions, wherein the improvement comprises:

a centrally positioned projection on said bottom cover having an enlarged end adapted to pass through the central opening in said hub when the covers are mated;

a latch assembly mounted centrally on said top cover and positioned for engagement by the projection, including a plurality of balls mounted therein for radial movement between inner engaged positions against the projection on the side of the enlarged end adjacent the bottom cover and outer release positions spaced from the projection to afford movement of the enlarged end therebetween; and

cam means operably coupled to said handle for moving said balls to their engaged positions when said handle is moved to its closed position, and for affording movement



of the balls to their release positions, when said handle is in its open position;

a pin tumbler lock mechanism including a key operated plug mounted in the top cover for rotation between locked and unlocked positions; and

bolt means coupled to the plug for engaging and preventing movement of the handle from its closed position when the plug is rotated to its locked position.

3,882,702

KEY FOR LOCK ANTI-PICK DEVICE

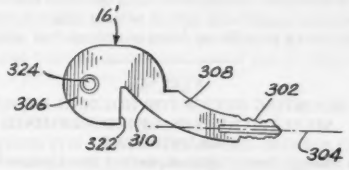
Max Wiczer, 9122 Kedvale, Skokie, Ill. 60652

Division of Ser. No. 294,385, Oct. 2, 1973, Pat. No. 3,765,199.

This application July 27, 1973, Ser. No. 383,184

Int. Cl. E05b *19/04*

U.S. Cl. 70—406 **2 Claims**



1. A key for use with a lock of the type having a key holder disposed ahead of the key slot and a key receiving recess in the holder having a curved key supporting wall extending from an outer periphery of the holder to a location adjacent the key slot, said key having:

a. a straight tumbler engaging portion along a straight axis for insertion into the key slot of the lock, said tumbler engaging portion being disposed on at least one edge surface of said key, spaced from, but generally parallel to, said straight axis,

b. a gripping portion,

c. a stem joining the gripping portion to said tumbler engaging portion, said stem having a curved bearing surface generally complementary to the curved supporting wall of the holder to facilitate sliding insertion of the key into the key slot, and

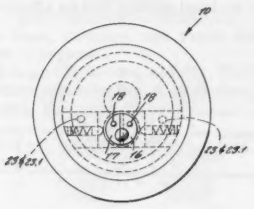
d. an edge located generally between said gripping portion and said stem and extending generally transverse to said axis so as to contact an end surface of said key holder when the key is inserted therein.

3,882,703

PICK-PROOF LOCK MECHANISM

Robert Hermann, P.O. Box 218, Stronghurst, Ill. 61480

Filed Jan. 29, 1974, Ser. No. 437,613
Int. Cl. E05b *63/00*
U.S. Cl. 70—419 **2 Claims**



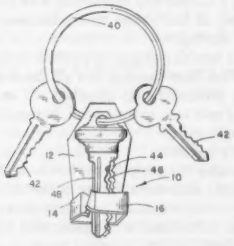
1. A pick-proof lock mechanism, comprising in combination, a cylinder and core assembly for application to a door or the like, said cylinder and core assembly having a crush resistant ring, said cylinder and core assembly including a pair of separateable door members, said door members having over lapping step portions for making engagement with each other, said cylinder and core assembly including a pair of plugs having holes that slidably carry a pin which is springly urged inward of said lock mechanism by means of coil springs, said lock mechanism including a two piece key comprised of a first member and a second member, said first member having a series of projections on an end thereof, said projections being receivable in openings upon an end of said second member, said lock mechanism including a slip band of tubular character having long and terminal grooves and protrustions in a central opening thereof, said grooves and protrusions corresponding to a configuration of said two piece key in order to fit on said key and hold said key together, lugs on a rear of said doors riding within a groove of said cylinder and core assembly, said plug being in said groove alongside said door members and being held in place by said pins which are fitted holes located in said grooves, said coil springs being positioned over each said pin, and a press fit cap being positioned over said spring.

3,882,704

KEY MOUNTING DEVICE FOR HOLDING A GROUP OF SELECTED KEYS IN A PREDETERMINED ARRANGEMENT

Victor Shanok; Jesse P. Shanok, both of Brooklyn, and Joseph Laszlo, New York, all of N.Y., assignors to Silvatrim Associates, South Plainfield, N.J.

Filed Apr. 11, 1974, Ser. No. 460,096
Int. Cl. A47g *29/10*
U.S. Cl. 70—456 R **10 Claims**



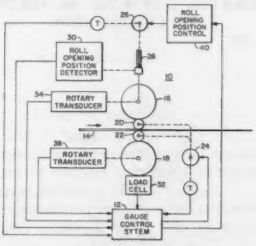
1. A key mounting device for holding a group of selected keys in a predetermined arrangement, said device comprising a body member upon which the keys can rest, aperture means through one end portion of said body member for receiving a key ring, tab means at an opposite portion for holding the keys relative to said body member, said tab means including a pair of leg members, a first section of one of said leg members being disposed over a second section of the other of said leg members, whereby the keys are passed between said first and second sections when being positioned on said body member and when being removed therefrom.

3,882,705

ROLL ECCENTRICITY CORRECTION SYSTEM AND METHOD

Richard Q. Fox, Orlando, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1974, Ser. No. 448,869
Int. Cl. B21b *37/00*
U.S. Cl. 72—11 **9 Claims**



1. A method of controlling the delivery gauge of a workpiece passing through a rolling mill stand having a pair of work rolls between which said workpiece is passed, with said work rolls respectively being operative with a pair of back-up rolls having eccentricity, said method including the steps of:

establishing values of said eccentricity of at least one back-up roll in relation to first and second angular positions of the other said back-up roll and in accordance with a predetermined relationship including the roll force between said work rolls and the angle of rotation for each of said first and second angular positions of said other back-up roll before said workpiece is passed between said work rolls,

measuring the angular position of said one back-up roll with said workpiece passing between said work rolls for selecting one of said values of eccentricity in relation to said measured angular position, and

controlling the delivery gauge of said workpiece passed between said work rolls in relation to the measured unloaded roll opening between said work rolls, the roll force between said work rolls, said selected value of eccentricity and the known modulus of elasticity of said roll stand.

3,882,706

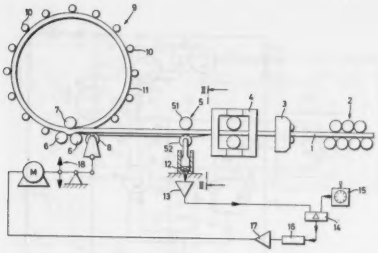
METHOD AND APPARATUS FOR PRODUCING HELICAL SEAM WELDED STEEL

Heinz Gross, Reichsmarkstrasse 142, 4600 Dortmund-Syburg, Germany; Harry C. Wade, 1205 Fennel St. E., Apt. 104, Hamilton, Ontario, and John W. Witts, 20 Damode Dr., Fonthill, Ontario, both of Canada

Division of Ser. No. 355,663, April 30, 1973, Pat. No. 3,851,376. This application Aug. 2, 1974, Ser. No. 494,279
Claims priority, application Germany, May 4, 1972, 2221776
Int. Cl. B21c *37/02*
U.S. Cl. 72—17 **3 Claims**

1. Apparatus for producing helical seam welded pipe from strip material including a strip bending machine comprising a three-roll bending device and a roll located adjacent said three-roll bending device and spaced upstream from it relative

to the direction of movement of the strip material, the rolls of said three-roll bending device being fixed and said rolls adjacent to them being movable transverse to the direction of movement of the strip material for controlling the entrance



angle of the strip into said three-roll bending device, and means for controlling the movement of said roll based on measurements of the deformation resistance of said strip material made at a position upstream from said roll.

3,882,707

APPARATUS FOR FORMING NECKS ON PIPES

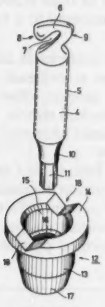
Gunter Rothenberger, Bad Homburg, Germany, assignor to Ing. Edwin Rothenberger, a/k/a Schweibtechnik- und Industrie-Bedarf, Frankfurt, Germany

Filed Oct. 29, 1973, Ser. No. 410,872

Claims priority, application Germany, Mar. 26, 1973, 7311408; June 13, 1973, 7322019

Int. Cl. B21d *51/40*

U.S. Cl. 72—117 **11 Claims**



1. An arrangement for forming cylindrical-shaped attachments of the periphery of pipe-shaped members comprising, in combination, a threaded bolt member having a hook-shaped head; a sleeve member coaxial with the axis of said bolt member and having a threaded portion for receiving said bolt member, said sleeve member having a cylindrical recess for the passage thereinto of said hook-shaped head; and a bearing rim on said sleeve member and having diametrically oppositely lying recesses, each recess extending the full width of the rim, said sleeve member contacting said pipe-shaped members at four contact lines.

3,882,708

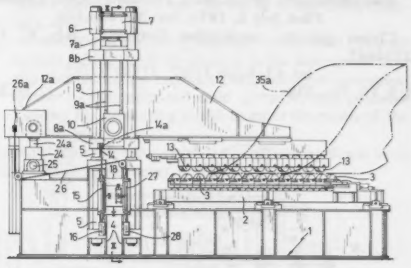
MACHINE FOR MANUFACTURING TUBES BY HELICALLY WINDING A METAL SHEET

Albert Pierre Ghislain Schaaps, Embourg, Belgium, assignor to Societe Anonyme des Ateliers de Construction de la Meuse, Sclessin-Ougree, Belgium

Filed Oct. 15, 1973, Ser. No. 406,662

Int. Cl. B21d *11/06*

U.S. Cl. 72—135 **6 Claims**



1. Machine for manufacturing tubes by helically winding a metal sheet, comprising a rigid frame, two parallel series of rollers disposed on said frame and forming outer bending members, vertical columns on said frame, a bearing beam suspended on said columns, a series of rollers at one end of said bearing beam forming an inner bending member parallel to said two outer bending members, a horizontal shaft supporting said beam and about the axis of which said beam pivots intermediate the ends of the beam, means guiding the shaft for vertical movement on said columns, a first hydraulic pressure jack having a vertical rod for raising and lower said shaft, means for supplying hydraulic fluid to said first jack, means responsive to vertical movement of said shaft in one direction to control said supply of hydraulic fluid to said first jack to return said shaft to a predetermined position, a second hydraulic jack articulated to the end of said beam remote from said rollers, and means responsive to variation in the inclination of said beam to operate said second jack to return said beam to a predetermined inclination.

3,882,709

METHOD FOR CONTROLLING THE PROFILE OF WORKPIECES ON ROLLING MILLS

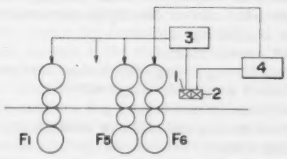
Toshiharu Kawamoto; Yoji Itoh; Kouji Hiyoudo, all of Sakai, and Kenya Fukushima, Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 15, 1973, Ser. No. 406,352

Claims priority, application Japan, Oct. 16, 1972, 47-102771

Int. Cl. B21b *1/22, 37/00*

U.S. Cl. 72—234 **10 Claims**



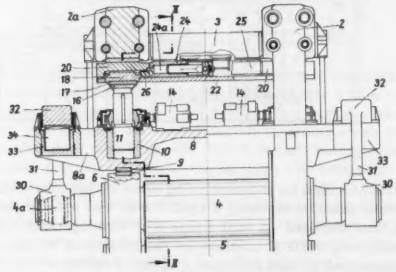
1. A method of controlling the crown of a workpiece passing through a rolling mill comprising the steps of roughly adjusting the crown by means of a first roughing stage of the rolling mill to produce a profile on the workpiece which is

within an allowable predetermined range for a successive second finishing stage of the rolling mill, and finely adjusting the crown by means of said second, finishing stage of the rolling mill to produce the desired profile on the workpiece by utilizing all but the final stand within said finishing stage.

3,882,710
ROLL STAND

Emil Friedrich Kersting, Dusseldorf, Germany, assignor to Maschinenfabrik Sack GmbH, Dusseldorf-Rath, Germany

Filed July 8, 1974, Ser. No. 486,606
Claims priority, application Germany, July 6, 1973, 2334442
Int. Cl. B21b *31/02, 31/08, 31/32*
U.S. Cl. 72—238 **5 Claims**



1. A roll stand comprising two lateral frames arranged in spaced parallel relationship; a window opening in each frame; a plurality of chocks in said window openings; a plurality of rolls extending between said lateral frames and journalled in said chocks; a laterally removable screwdown cross-beam extending between said lateral frames and through said window openings between the top of each frame and an uppermost roll; and associated with each frame, a screw-down mechanism removable with the cross beam and comprising: a nut fixedly mounted on the cross beam, a thrust member in screw-threaded engagement with said nut, and a drive mechanism mounted on said cross beam for imparting a rotary motion to said thrust member while permitting movement thereof relative to said nut; the cross beam in the screwed-down condition being braced against the upper part of the frame by means of said thrust members.

3,882,711
ELECTRONIC TEMPERATURE SENSOR AND INDICATOR

Newton W. Crawford, 3751 Dell Rd., Carmichael, Calif. 95608

Filed Dec. 11, 1972, Ser. No. 313,840
Int. Cl. G01k *7/24*
U.S. Cl. 73—362 AR **9 Claims**

1. Electronic temperature measuring apparatus for providing an electrical current directly proportional to sensed temperatures comprising:

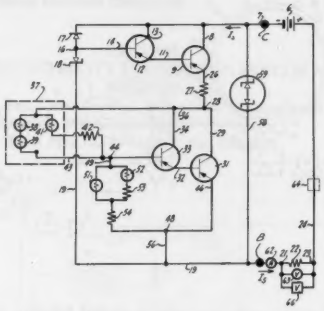
a. a D.C. power source,

b. means for regulating voltage from said power source to provide a regulated voltage output,

c. first transistor means having an emitter, base and collector, said emitter and collector connected to said regulated voltage output,

d. temperature measuring means having an effective electrical resistance responsive to the sensed temperature, said temperature measuring means connected to said collector and coupled to the base of said first transistor means whereby the effective resistance of said temperature measuring means controls current through the emitter-collector circuit of said first transistor means, thereby defining an effective resistance versus current characteristic function,

e. said temperature measuring means having an effective resistance versus temperature characteristic function approximately equal to said effective resistance versus current characteristic function,



f. means connected to the emitter of said first transistor means and coupled to said base for biasing the emitter-base junction of said first transistor means, and

g. means responsive to the current through said first transistor means for measuring the sensed temperature.

3,882,712
PROCESSING COPPER BASE ALLOYS

Stanley Shapiro, New Haven, and Ronald N. Caron, Branford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 1, 1973, Ser. No. 402,479
Int. Cl. B21b *3/00*
U.S. Cl. 72—364 **10 Claims**

1. A method for obtaining improved 0.01 percent offset yield strength characteristics in copper or copper base alloy formed parts which comprises:

A. providing a copper base alloy material in plate form having a thickness of from 0.300 to 1.800 inches;

B. cold rolling said material to a total reduction of at least 65 percent;

C. heat treating said material at 100° to 350°C for from 30 minutes to 8 hours to decrease the tensile strength and increase the 0.01 percent offset yield strength while retaining the cold worked matrix;

D. forming said material after said heat treatment step into a formed part; and

E. heat treating the formed part at 100° to 350°C for from 30 minutes to 8 hours to decrease the tensile strength and increase the 0.01 percent offset yield strength while retaining the cold worked matrix,

thereby providing a formed part having high yield strength characteristics.

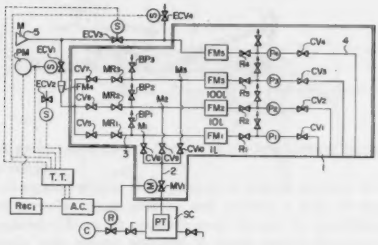
3,882,713
DEVICE FOR MEASURING SENSUOUS DEGREE OF ODOR

Kazuko Nishida, Shiga-ken; Kazuji Bota, Ohmihachiman, and Tadao Ando, Kusatsu, all of Japan, assignors to Nippon Airwick Service Co., Ltd., Ohmihachiman-shi, Japan

Filed June 18, 1973, Ser. No. 371,114
Int. Cl. G01n *31/00*
U.S. Cl. 73—23 **2 Claims**

1. A device for measuring sensuous degree of odor comprising at least two first conduit means for flowing non-odorous air, means for flowing said non-odorous air at a predetermined flow rate, a source of odorous air, second conduit means

connected to one of said first conduit means for adding the odorous air from said source to the flowing non-odorous air, means for controlling continuously the amount of odorous air to be added to the flowing non-odorous air, means for automatically recording the amount of added odorous air, third conduit means for the odorous air-containing air extending from said first conduit means for non-odorous air, a mask



connected to the other first conduit means for non-odorous air and said third conduit means for odorous air-containing air, means for discharging the non-odorous air and odorous air-containing air alternately at a predetermined time interval, through said mask into the nostrils of a person determining the point when an odor is smelled and when the odor is not smelled, and means for recording the amount of odorous air added at the smelling point and at the non-smelling point.

3,882,714

POROSIMETER

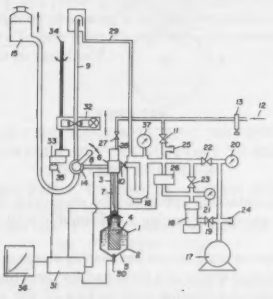
Werner Libal, and Robert Hausner, both of Leoben, Austria, assignors to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria

Filed Nov. 13, 1973, Ser. No. 415,303

Claims priority, application Austria, Nov. 29, 1972, 10174/72

Int. Cl. G01n *15/08*

U.S. Cl. 73—38 **23 Claims**



1. A porosimeter comprising
1. a source of fluid pressure,
2. a source of vacuum,
3. a dilatometer consisting essentially of
   a. a vessel for receiving a porous sample and a measuring liquid which does not wet the sample,
   b. a capillary tube removably placed on the vessel and forming a fluid-tight seal therewith, and
   c. a filling capillary having a tip inserted in the capillary tube,
4. a measuring capillary containing the measuring liquid,
5. a first multi-way valve selectively connecting the filling capillary to the measuring capillary and to the fluid pressure source,
   a. valve means being arranged for selective disconnection of the fluid pressure source from, and connection of the vacuum source to, the multi-way valve,
   b. connection of the filling capillary to the measuring capillary causing the measuring liquid to flow from the measuring capillary through the filling capillary into the dilatometer to raise the level of the measuring liquid therein until it reaches the tip of the filling capillary, and
   c. connection of the filling capillary to the fluid pressure source raising the fluid pressure in the dilatometer and thus depressing the measuring liquid level in correspondence to the increased fluid pressure, this pressure causing the measuring liquid to enter the pores of the sample, and
6. control means for maintaining the measuring liquid level in the dilatometer substantially constant.

3,882,715

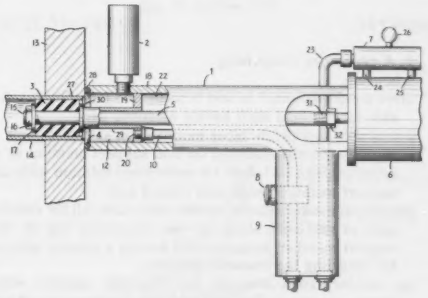
AIR LEAK DETECTOR

William R. Slinger, Kearney, N.J., assignor to Treadwell Corporation, New York, N.Y.

Filed July 5, 1973, Ser. No. 376,745

Int. Cl. G01m *3/28*

U.S. Cl. 73—46 **1 Claim**

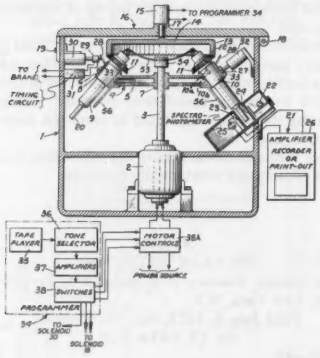


1. A device for detecting leaks in a joint between a tube sheet and a tube end fitted into an opening in said sheet comprising a barrel having an internal diameter larger than the external diameter of said tube, and sealing means surrounding said barrel at one end thereof adapted to seal said barrel to said sheet when said barrel is placed against said sheet, a draw rod in said barrel having an end extending beyond said barrel, a radially expandable plug surrounding at least a portion of the draw rod which extends from said barrel, said plug fitting inside said tube, means for expanding said plug to seal said tube, a chamber located at the end of said barrel, the sheet and plug defining one wall of said chamber, and a barrel plate internal to and spaced from said plug defining the other wall of said chamber, means for evacuating said chamber to a pressure below atmospheric pressure, gauge means connected to said chamber for reading increases in pressure in said chamber after evacuation, means for isolating said chamber from the vacuum source, and means for reciprocating said rod which means comprises a cylinder, a piston in said cylinder, means for selectively introducing a fluid on either side of said piston, said piston being attached to the end of said rod at a position remote from the end of said barrel.

3,882,716
CENTRIFUGAL APPARATUS AND CELL

Elliott Beiman, 305-A White Ave., Northvale, N.J. 07647

Filed July 17, 1972, Ser. No. 272,563
Int. Cl. G01n 31/02
U.S. Cl. 73—61.4 11 Claims



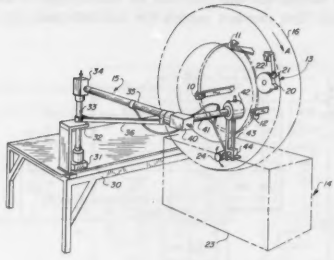
1. A centrifuge comprising:
a housing,
drive means mounted in said housing and including a rotatable longitudinal shaft having a central axis,
a rotatable support member mounted on said shaft,
a plurality of cells mounted on said support member at an acute angle to said shaft for centrifugal rotation with said support member about said central axis,
peripheral means secured around each said cell for rotating each of said cells about its own respective axis on said support member, each said cell having a portion adapted for detecting the contents thereof,
an annular axially movable non-rotatable member selectively engageable with said peripheral means around said cells to rotate said plurality of cells simultaneously about their respective axes,
read out means disposed within said housing adjacent the path of said cells for detecting the contents of said cells, and
control means for sequentially positioning said cells adjacent said read out means.

3,882,717
SELF-ADJUSTING ULTRASONIC TIRE INSPECTION DEVICE

Porter T. McCauley, Winnetka, Ill., assignor to James Electronics Inc., Chicago, Ill.

Filed June 20, 1973, Ser. No. 371,601
Int. Cl. G01n 29/04
U.S. Cl. 73—67.8 S 14 Claims

1. An ultrasonic tire inspection device comprising means for rotating a tire, an ultrasonic transmitting transducer, an ultrasonic receiving transducer, means for supporting said ultrasonic transmitting transducer on one side of the tire casing and said ultrasonic receiving transducer on the opposite side of the tire casing, means for rotating said tire through at least two complete 360° revolutions, means responsive to the output of said receiving transducer during a first 360° revolution for setting an average bias level, and means responsive to the output of the receiving transducer on another of said 360°

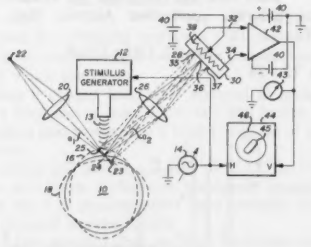


revolutions for recording significant variations from said average bias level.

3,882,718
NONCONTACTING PRESSURE MEASURING APPARATUS

Anthony R. Kriebel, Menlo Park, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed May 5, 1971, Ser. No. 140,359
Int. Cl. A61b 3/16
U.S. Cl. 73—80 12 Claims



1. A noncontacting apparatus for measuring internal pressure within an eyeball having a deformable wall surface comprising:
stimulus generating means developing continuously oscillating pressure waves of a fluid and for directing such waves upon said deformable wall surface of the eyeball under test to cause responsive vibratory deflection thereof, said pressure waves having an oscillating frequency variable over a range of frequencies including a resonant frequency of said eyeball and said stimulus generating means being spaced apart from said eyeball by said fluid;
means for directing a beam of light upon said surface to develop a reflected light beam;
light detecting means responsive to said reflected light beam and operative to develop an electrical signal commensurate with the deflection of said surface; and
indicating means responsive to said electrical signals and operative to indicate said resonant frequency.

3,882,719

DEVICE FOR USE IN LOADING TENSION MEMBERS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention by, and Walter T. Appleberry, Long Beach, Calif.

Filed May 10, 1973, Ser. No. 359,156
Int. Cl. G01l 5/04
U.S. Cl. 73—143 1 Claim

1. A prestressed device for use in loading tension members comprising:

an elongated elastic body having at least a portion thereof of circular cross section and having a pair of shanks extended from the opposite ends thereof for coupling said body with means adapted to apply tensile force to said body;

means defining on the external surface of said portion of said elastic body an annular shoulder;

means defining in space relation with said annular shoulder a screw-thread extended along the surface of said elastic body;

an internally screw-threaded nut seated in mated relationship with said screw-thread;

a rigid sleeve telescopically received on said circular portion of said elastic body and having one end thereof disposed in abutting engagement with said annular shoulder and the opposite end thereof disposed in juxtaposition with said nut so that as a tensile force is applied to said shanks, the elastic body is caused to elongate, whereby a repositioning of the nut into abutting engagement with said sleeve is facilitated for supporting the elastic body in a prestressed condition, subsequent to removal of applied tensile force;

said sleeve being circular in cross section and having an internal diameter substantially equal to the external diameter of said circular portion of said elastic body whereby said sleeve fits snugly with said portion of said body;

said sleeve being freely rotatable relative to said body when said nut is not pressing against said opposite end of said sleeve thereby providing a tactily detectable indication as to when a tensile force exceeding such prestress force is reapplied to said body.

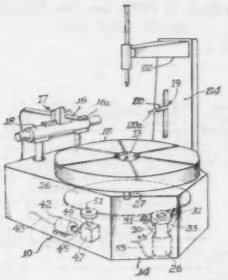
3,882,720

GEAR CHECKING MACHINE HAVING A FRICTIONALLY DRIVEN SUPPORT TABLE AND POSITION ENCODER

Edward Francis Fabish, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 17, 1973, Ser. No. 425,436
Int. Cl. G01m 13/02
U.S. Cl. 73—162 5 Claims

1. A gear checking machine comprising a frame, indicating means, a table rotatably mounted in said frame for supporting a gear to be checked, sensing means mounted adjacent said gear for supplying a signal to said indicating means which is indicative of the surface variations of said gear, a first shaft, a relatively large diameter circular disc coupled to said table by said first shaft and supported below said table by said first shaft, first and second small circular wheels each having a diameter substantially smaller than the diameter of said large disc, said first small wheel having its periphery in engagement with the periphery of said large disc, disc drive means coupled to said second shaft for simultaneously revolving said first and second small wheel, said table and said large disc, sensing drive means for driving said sensing means in synchronism with said table and said disc, a third shaft coupled to said second small wheel and encoder means coupled to said third



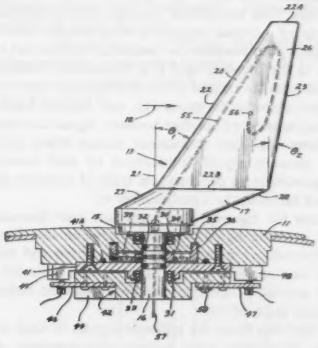
shaft for supplying output signals which are a function of the rotation of said table.

3,882,721

VANE TYPE AIRFLOW SENSOR

Donald M. Neary, and John A. Doremus, both of Wayzata, Mich., assignors to Rosemount Inc., Minneapolis, Minn.

Filed Nov. 16, 1973, Ser. No. 416,360
Int. Cl. G01w 1/10
U.S. Cl. 73—188 14 Claims

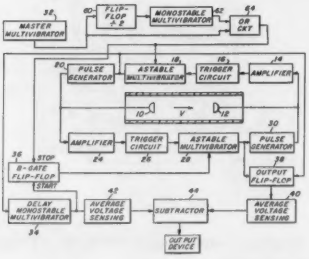


1. An airflow sensor suitable for use on an aircraft comprising a support housing having an outwardly facing surface, a shaft rotatably mounted in said housing about a shaft axis, a vane mounted on said shaft and extending outwardly from said outwardly facing surface of said housing in a preselected orientation thereto, said vane being positioned to be assymmetrically located with respect to said axis and having a leading edge swept rearwardly with respect to normal fluid flow at a first acute angle, and said vane further having a trailing edge swept rearwardly at an angle less than said first acute angle whereby said vane swept edges converge in direction outwardly from said outwardly facing surface, counterweight means mounted on said shaft and positioned on the interior of said housing for counterbalancing said vane, and means to sense movement of said shaft from a first preselected rotational position.

3,882,722
MULTIPLE TIME DIFFERENCE ULTRASONIC FLOWMETERS

James L. McShane, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 7, 1973, Ser. No. 395,318
Int. Cl. G01f 1/00
U.S. Cl. 73—194 A 3 Claims



1. In a flowmeter of the type wherein at least one pair of oppositely disposed ultrasonic transducer means are located in acoustic contact with a fluid stream and in upstream-downstream relation thereto; a first feedback path couples the output of a first of said tranducer means to the input of a second of the transducer means such that upon one acoustic signal being transmitted upstream from the second transducer means to the first transducer means the transmission of another acoustic signal upstream is initiated from said second transducer means when said one upstream acoustic signal is received by said first transducer means, thus generating an upstream train of acoustic signals in sing-around fashion; a second feedback path couples the output of said second transducer means to the input of said first transducer means such that upon one acoustic signal being transmitted downstream from said first transducer means to the second tranducer means the transmission of another acoustic signal downstream is initiated from said first transducer means when said one downstream acoustic signal is received by said transducer means, thus generating a downstream train of acoustic signals in sing-around fashion; the combination of:

gating means for causing said upstream and downstream trains of acoustic signals to occur between said first and second transducer means during respective and successive first and second predetermined time intervals, said first and second predetermined time intervals being different from each other;

means for deriving from the acoustic signals in each of said trains an elementary time interval characteristic of the fluid stream velocity; said elementary time interval increasing by Δt increments from one transmitted acoustic signal to the next;

means coupled to said deriving means for generating a first sum signal representing the sum of said elementary time intervals through said first predetermined time interval proportional to:

$$\Delta t + 2\Delta t + 3\Delta t + \ldots + N\Delta t$$

where Δt is the elementary time interval for the first acoustic signal in the corresponding train of acoustic signals and N is the number of acoustic signals transmitted and received successively occurring during said first predetermined time interval and for generating a second sum signal representing the sum of said elementary time intervals through said second predetermined time interval proportional to:

$\Delta t + 2\Delta t + 3\Delta t + \ldots + N'\Delta t$ where Δt is the elementary time interval for the first acoustic signal in the corresponding train of acoustic signals and N' is the number of acoustic signals transmitted and received successively occurring during said second predetermined time interval; and

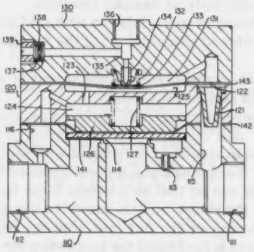
means responsive to said sum representing signal for each of said different predetermined time intervals for deriving first and second sum signals for providing signal combination thereof;

said first and second predetermined time intervals being such that $N=N'$, and the difference between said first and second predetermined time intervals being less than the nominal travel time between said first and second tranducer means for the condition of no fluid flow therebetween, thereby to compensate for deviations in each of said sum signals due to change in the speed of sound.

3,882,723
FLUID PRESSURE APPARATUS

David John Wickham, London, England, assignor to Westinghouse Brake and Signal Co., Ltd., London, England

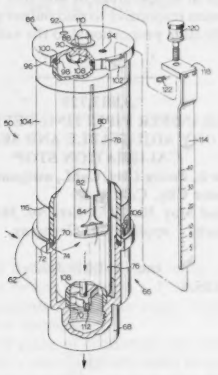
Filed Oct. 8, 1971, Ser. No. 187,614
Claims priority, application United Kingdom, Oct. 26, 1970, 50800/70; Apr. 2, 1971, 08507/71; Apr. 2, 1971, 08508/71
Int. Cl. G01f 1/00; G01p 5/14
U.S. Cl. 73—199 11 Claims



1. Fluid pressure responsive apparatus for sensing measuring and controlling fluid flow in a conduit, comprising a fluid tight vessel internally divided into a first and a second chamber by a pressure responsive member, said first chamber having a first port for a first fluid pressure signal, said second chamber having a second port for a second fluid pressure signal, and said second chamber having a third port, said pressure responsive member comprising a flexible fluid-tight membrane with a surface portion deformable to itself close said third port when the force exerted on said pressure responsive member, including the pressure in the first chamber, exceeds the opposing force exerted on said member, including the pressure in the second chamber, the third port being vented through a restricted passage to atmosphere, the fluid pressure in said passage from said second chamber depending on the degree of closure of the third port by the deformation of the member in response to said excess force, the flow in said passage giving rise to a third fluid pressure signal indicative of the difference between the first and second pressures, a fluid pressure signal utilization arrangement responsive to said third signal, said first port being connected to a first point on said fluid pressure conduit and said second port being connected to a second point on said fluid pressure conduit upstream from a first flow restrictor, which is itself upstream from said first point, through a second flow restrictor of similar flow characteristics to said first flow restrictor such that the flow through one simulates the flow through the other under the same conditions, the fluid pressure utilization arrangement being responsive to the magnitude of said third signal to indicate the flow in said fluid pressure conduit, said fluid pressure conduit having a full-bore by-passing the first restrictor and including a valve for said by-pass controlled by a closure element operable in response to the pressure difference across the first

restrictor produced by fluid flow through the restrictor to the downstream part of the conduit.

3,882,724
FLOWMETER
William Rouse Hearn, Box 306, Clinton, Ontario, Canada
Filed May 4, 1973, Ser. No. 357,460
Int. Cl. G01f *1/00*
U.S. Cl. 73—215 **1 Claim**

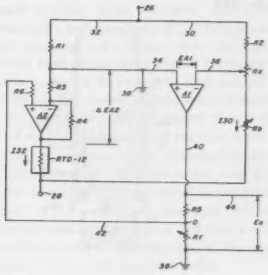


1. A gravity feed meter to measure the flow of liquid material from a supply comprising a first chamber having a vertically disposed wall, a first proportional weir in said wall, a second chamber surrounding first chamber in spaced apart relationship, the lower end of one of the said chambers being connected to said supply, said one chamber having an opening to atmosphere with said liquid material flowing upward therein, through said weir into and downward by gravity out to the other chamber, a vertically disposed scale on one of said chambers, said wier being calibrated to deliver predetermined amounts of liquid material at a predetermined temperature at levels indicated on said scale; a second proportional weir below said first proportional weir in said wall of said first chamber, the top of said second proportional weir communicating with the bottom of said first proportional weir, said second proportional weir facilitating the reading of smaller amounts of liquid material than that passing through the first proportional weir.

3,882,725
TEMPERATURE MEASURING APPARATUS AND METHOD WITH RESISTANCE AMPLIFIER
Dhulipala M. Rao, Penn Hills, and James F. Sutherland, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 5, 1972, Ser. No. 268,952
Int. Cl. G01k *7/20*; **G05f** *1/46*
U.S. Cl. 73—342 **12 Claims**

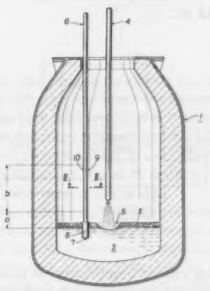
1. Apparatus for generating a signal as a function of the resistance change of a resistance temperature detector element comprising:

a. a resistance bridge network having its inputs connected to a constant current source;
b. a resistance temperature detector element connected in one leg of the bridge;
c. a first operational amplifier connected across the outputs of said bridge to generate an output signal;
d. a second operational amplifier having one input terminal and its output terminal connected in series with the resistance temperature detector element in said one leg of said bridge, and
e. means for applying a feedback signal derived from the output of said first operation amplifier to the other input



of said second operational amplifier whereby the second operational amplifier will balance the bridge by adding an incremental potential to said one leg to compensate for any potential change in said leg caused by a change in the resistance of said resistance temperature detector.

3,882,726
WATER-COOLED LANCE OR PROBE DESTINED TO BE INSERTED INTO METALLURGICAL FURNACES
Hellmuth Smejkal, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria
Filed Aug. 6, 1973, Ser. No. 385,724
Claims priority, application Austria, Aug. 7, 1972, 6789/72
Int. Cl. G01k *1/12, 7/04*
U.S. Cl. 73—343 R **8 Claims**

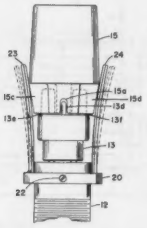


1. A water-cooled lance for use in metallurgical technology, such as a probe for continuously measuring the temperature of a metal bath, comprising an inner tube, a concentric outer tube, an intermediate guiding tube arranged between the inner and outer tubes so as to define inner and outer annular passages through which a coolant can be circulated, and means for effecting differential cooling of two different portions of a circumference of the lance along at least a part of the length of the lance, whereby a side of the lance exposed to a greater heat than an opposite side of the lance can be correspondingly cooled to a greater degree than said opposite side.

3,882,727
COOLING CURVE APPARATUS

Alexander H. Clark, Norristown, Pa., and Richard J. Hance, Philadelphia, Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed July 3, 1974, Ser. No. 485,665
Int. Cl. G01k *13/12*; **G01n** *25/04*
U.S. Cl. 73—354 **9 Claims**



1. A holder for an expendable mold for phase change detection apparatus of the type wherein a mold containing a heat sensing element has electromechanical contact structure for plug-in engagement with mating electromechanical contact structure of a test stand, said holder comprising:

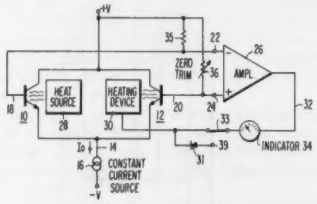
temperature responsive means to engage and provide a holding force on an expendable mold when said mold and said temperature responsive means are at substantially the ambient temperature of a test location and release said holding force when said temperature responsive means is heated to a temperature substantially higher than said ambient temperature by molten material poured into said mold, and

means for securing said temperature responsive means to said test stand in a position to engage and release said mold.

3,882,728
TEMPERATURE SENSING CIRCUIT

Harold Allen Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 6, 1973, Ser. No. 385,645
Int. Cl. G01k *7/00*
U.S. Cl. 73—362 SC **10 Claims**



1. A measuring circuit comprising, in combination:

two semiconductor devices, each including an input electrode and an output electrode, connected at their input electrodes, said devices being physically separated and thermally isolated from one another, the first of said devices being located next to an object whose temperature it is desired to measure relative to that of the second device and the second device being at a second location, said two semiconductor devices comprising transistors, each having an emitter electrode, a base electrode and a collector electrode, said input electrodes comprising said emitter electrodes and said output electrodes comprising said base electrodes;

means connected to said input electrodes for applying one portion of a constant current to the first of said devices and the remainder of said constant current to the second of said devices, the ratio of said currents being a given value when the two devices are at the same temperature;

means connected to said output electrodes for producing an output signal having a parameter at a reference value when the two devices are both at a reference temperature and responsive to a change from said given value of the ratio of the currents passing through said devices which occurs when said first device is heated by said object to a higher temperature than said second device, for producing an output signal having a parameter proportional to the change in temperature of said first device; and

indicator means responsive to said output signal for producing an indication proportional to the value of said parameter.

3,882,729
LIQUID TRANSFER PIPETTING DEVICE WITH A FACTORY ADJUSTABLE AND SEALABLE CALIBRATION STOP

William J. Roach, Foster City, Calif., assignor to Oxford Laboratories, Foster City, Calif.

Filed May 30, 1973, Ser. No. 365,227
Claims priority, application Germany, Apr. 16, 1973, 2319175
Int. Cl. B01l *3/02*
U.S. Cl. 73—425.6 **5 Claims**

3. In a liquid transfer pipetting device that includes a hollow barrel shaped handle member, a piston chamber within said barrel, a piston element within said piston chamber and extending outward through one end of said piston chamber, an elongated plunger extending through one end of said barrel member for imparting reciprocal motion to said piston, resilient means within said barrel for normally urging said piston toward said one end of said piston chamber, and means extending from an opposite end of said barrel for engaging a hollow detachable tip and for providing fluid communication between another end of said piston chamber and an internal portion of said tip, the improvement comprising:

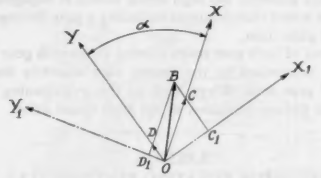
a calibration stop threadedly attached to said elongated plunger within the barrel member for limiting travel of the piston and plunger toward said one end of the barrel member by engaging an internal barrel member surface at its said one end, whereby the piston stroke can be calibrated by turning said calibration stop with respect to said plunger, and

means fixing said calibration stop to said plunger for preventing rotation therebetween, whereby the calibrated piston stroke is maintained.

3,882,730
METHOD OF DETERMINING THE CORRECTION COMPONENTS OF THE OUT-OF-BALANCE WEIGHT, MAKING ANY ANGLE BETWEEN THEM, ON A DYNAMIC BALANCING MACHINE

Louis Laguna, and Christian Langlois, both of Castres, France, assignors to Regie Nationale des Usines Renault, Billancourt, France

Filed Sept. 7, 1973, Ser. No. 395,159
Claims priority, application France, Oct. 16, 1972, 72.36608
Int. Cl. G01m *1/14*
U.S. Cl. 73—462 **3 Claims**



2. A method of determining the correction components of an out-of-balance weight vector on a dynamic balancing machine, said components lying at an angle α between one another, said method comprising:

defining in each plane of correction two axes of measurement OX_1, OY_1 associated with each of two axes of correction of OX and OY and such that the axis OX_1 is perpendicular to the axis OY and the axis OY_1 is perpendicular to the axis OX;

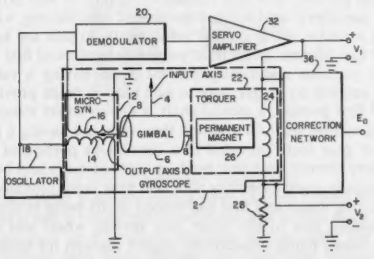
deriving a signal from measurements made along each of said axes of measurement OX_1, OY_1, said signal defining correcting factors associated with the respective measurement axes OX_1, OY_1; and

deriving vector components of correction along axes OX and OY, by multiplying the projections on axes OX_1 and OY_1 multiplied by a coefficient $1/\sin \alpha$ where α is the angle between OX and OY.

3,882,731
TORQUER SCALE FACTOR TEMPERATURE CORRECTION MEANS

Menno G. Koning, Dover, Mass., assignor to Northrop Corporation, Los Angeles, Calif.

Filed July 31, 1973, Ser. No. 384,246
Int. Cl. G01p *15/08*; **G01c** *19/28*
U.S. Cl. 73—497 **8 Claims**



1. In a system for measuring an applied input function having a torque-to-balance feedback servo loop, said loop including a torquer having a permanent magnet and a driving coil magnetically coupled thereto, the resistance of said coil being a linear function of temperature over a predetermined temperature range, said coil being connected in series to a substantially low temperature coefficient resistor, wherein the measure of an applied input function is equal to the product of a torquer scale factor and a drive current passing through said coil, said torquer scale factor being a linear function of the temperature of said torquer over said temperature range, the improvement comprising:

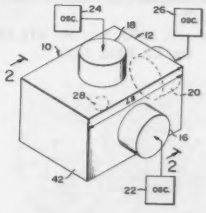
a generating means connected to said torquer driving coil and said resistor for generating an output signal representative of said applied input function, said output signal being substantially independent of the temperature variation of said torquer scale factor over said temperature range wherein said generating means includes

a weighted sum network having first and second input terminals and an output terminal, said second input terminal being connected to the junction point of one terminal of said coil and one terminal of said resistor, said first input terminal being connected to the terminal at the opposite end of said coil from said junction point, and wherein said output signal at said output terminal is proportional to a weighted sum of the voltages across said first and second input terminals, said output signal and said voltages being measured with respect to the terminal at the opposite end of said resistor from said junction point.

3,882,732
MATERIAL SUSPENSION WITHIN AN ACOUSTICALLY EXCITED RESONANT CHAMBER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Taylor G. Wang, Glendale, Calif.; Melvin M. Saffren, Altadena, Calif., and Daniel D. Elleman, La Canada, Calif.

Filed Aug. 31, 1973, Ser. No. 393,523
Int. Cl. G01c *19/16*, *1/00*
U.S. Cl. 73—505 **11 Claims**



9. A method for positioning an object comprising:

establishing the object in a chamber of substantially rectangular cross-section that contains a fluid, with a first pair of walls of the chamber extending substantially parallel to each other and perpendicular to a second set of walls, and with the separation of the first walls different than the separation of the second walls; and

applying acoustic energy to the fluid in a first mode which is in a direction substantially perpendicular to the first pair of walls and at a frequency that is resonant to the separation distance of the first pair of walls, and in a second mode which is in a direction substantially perpendicular to the second pair of walls at a frequency that is resonant to the separation distance of the second walls.

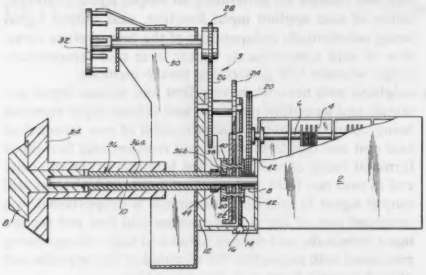
3,882,733
FINE TUNING SHAFT FOR TV TUNER

Kanji Fukui, and Akira Otsuki, both of Kakuda, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1974, Ser. No. 434,789
Claims priority, application Japan, Jan. 30, 1973, 48-13265
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.54 **12 Claims**

1. In a tuner comprising a tuning element, a coarse tuning input member, a fine tuning input member, and means opera-

tively connecting said members and said element so that actuation of either member causes movement of said element and actuation of said coarse tuning input member also causes movement of said fine tuning input member; the improvement which comprises said connecting means between said fine tuning input member and said element comprises a first section operatively connected to said fine tuning input member to be driven thereby, a second section operatively connected to said element to drive the latter, and a resilient force-transmitting member drivingly interposed between said sections, whereby the position of said fine tuning input member relative to said coarse tuning input member does not shift appreciably when the latter is moved.

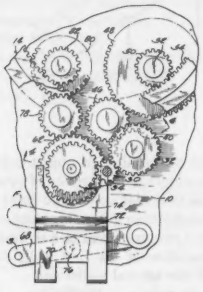


3,882,734

TWO-SPEED CONSTANT DRIVE TIMER

George Obermann, Niles, and John Willigman, Elk Grove Village, both of Ill., assignors to Controls Company of America, Schiller Park, Ill.

Filed Nov. 19, 1973, Ser. No. 416,982
Int. Cl. F16h *5/06*
U.S. Cl. 74—337.5 **1 Claim**



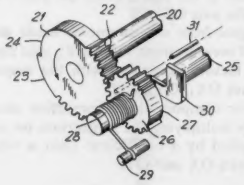
1. A two-speed timer including
a frame,
a timing cam rotatably mounted in the frame,
a motor mounted in the frame and having a drive pinion,
a slow speed gear train having an input gear driven by the drive pinion and including an overrunning clutch having an input and an output and located at the input to the gear train with the clutch input driven by said input gear and the clutch biased into engagement with the clutch input with an overrunning ratchet drive between the clutch input and output so the clutch output overruns the clutch input if rotated faster than the clutch input,
a selectively operable high speed clutch including an input and an output and having its input continuously driven by the pinion,
said high speed clutch output being rotatably mounted on the frame and axially movable on its rotational axis into engagement with the high speed clutch input,
a coil spring acting between the frame and the high speed clutch output biasing the high speed clutch output into engagement with the high speed clutch input,
a beam-type spring mounted on the frame and bearing on the high speed clutch output and operative to overcome said coil spring to move the high speed clutch output out of engagement with the high speed clutch input,
a lever pivoted on the frame and manually movable from an inoperative position to an operative position in which it acts on the beam-type spring to move it to an inoperative position whereby the high speed clutch is engaged,
said high speed clutch output including a gear driving a high speed gear train,
the output of both gear trains driving a common gear operatively connected to the timing cam whereby the slow speed gear train drives back to the overrunning clutch output during operation of the high speed drive.

3,882,735

DEVICE FOR ROTATING RECIPROCALLY

Tadayoshi Shimodaira, and Kazuto Tsunai, both of Matsumoto, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Nagano, both of, Japan

Filed Nov. 20, 1973, Ser. No. 417,561
Claims priority, application Japan, Nov. 20, 1972, 47-115619
Int. Cl. F16h *55/04*
U.S. Cl. 74—435 **5 Claims**



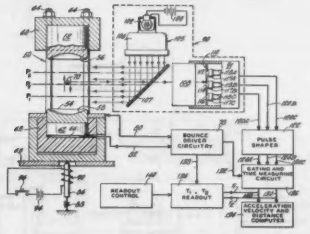
1. A device for translating unidirectional rotation into reciprocal motion comprising a unidirectionally rotatable first shaft, a driving wheel mounted on said first shaft and rotatable therewith, said driving wheel having a periphery including a plurality of gear teeth provided in a first portion thereof, said gear teeth having substantially equi-height top and bottom lands, a cam provided in a second portion thereof adjacent said first portion, said cam radially extending on said driving wheel periphery, said second portion of said driving wheel having a radius which extends substantially to said top lands of said first portion, and a third portion between said first and second portions and contiguous therewith having a radius which extends no longer than to said bottom lands provided in said first portion, a second shaft, a driven wheel mounted on said second shaft for rotation therewith and having a plurality of gear teeth provided in a continuous portion of the periphery thereof, said gear teeth on said second wheel being substantially complementary with said gear teeth provided in said driving wheel said first and second shafts being in spaced relationship, one to the other, said driving wheel and said driven wheel being respectively aligned thereon for meshing engagement of respective gear teeth provided therein so as to permit said driving wheel to rotate said driven wheel in a first direction, said gear teeth provided in said driven wheel defining a concomitant plurality of top and bottom lands therein, said driven wheel having a remaining peripheral sector having a radius which extends no farther than said bottom lands provided in said continuous portion thereof, and a biasing means connected to said driven wheel for rotatably biasing

said driven wheel in a direction opposite to that in which said driven wheel is driven by said driving wheel.

3,882,736
APPARATUS FOR MAINTAINING AN OBJECT IN BOUNCING MOTION, AND FOR SENSING AND INDICATING THE POSITION AND/OR MOTION THEREOF

Theodore D. Jayne, Swarthmore, Pa., assignor to General Technical Services, Inc., Upper Darby, Pa.

Filed July 26, 1968, Ser. No. 749,521
Int. Cl. G01p *3/42*
U.S. Cl. 73—505 **15 Claims**

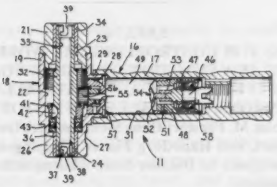


1. In inertial sensor apparatus comprising means for bouncing a body repetitively between a pair of generally opposed surfaces and for permitting said body to move substantially free of constraints and contacts between successive bounces, and further comprising means for sensing and indicating the position and/or motion of said body between said successive bounces, the improvement according to which one of said generally opposed surfaces has a non-planar configuration for opposing departures toward an edge of said one surface of the point thereof on which said body bounces.

3,882,737
DRILL-LIKE DRIVING DEVICE

Paul E. Crim, Portage, and Wayne Warfield, Kalamazoo Township, Kalamazoo County, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Division of Ser. No. 229,680, Feb. 28, 1972, Pat. No. 3,797,497. This application Dec. 27, 1973, Ser. No. 428,843
Int. Cl. F16h *37/06*
U.S. Cl. 74—665 S **4 Claims**



1. A drill-like driving assembly, comprising:

substantially T-shaped casing means having a main housing part and a handle part fixedly secured to said main housing part at a location disposed intermediate the ends thereof, said main housing part and said handle part comprising elongated tubular members disposed with their longitudinally extending axes positioned to substantially intersect one another at substantially right angles;

input means rotatably supported within the interior of said handle part, said input means having a rotatable coupling member disposed adjacent the free end of said handle part adapted for connection to an external power source;

elongated output shaft means rotatably disposed within and extending longitudinally of said main housing part, said output shaft means having an opening extending continuously therethrough in a direction substantially parallel to the longitudinally extending direction of said main housing part, said output shaft means also having first and second torque transmitting coupling portions provided thereon adjacent the opposite free ends thereof;

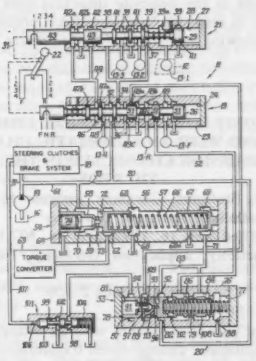
gear means drivingly connected between said input means and said output shaft means for transmitting rotation therebetween, said gear means being disposed adjacent the junction of said main housing part and said handle part and including first and second meshing gear members mounted for rotation about axes substantially perpendicular to one another; and

driven means detachably connectible to said output shaft means and rotatable thereby, said driven means including a stationary housing member releasably attached to said casing means and driven shaft means rotatably supported within said housing member, said driven shaft means including means for releasably and nonrotatably engaging a working element, said driven shaft means also having coupling means associated therewith and releasably engageable with one of said first and second coupling portions for drivingly connecting said driven shaft means to said output shaft means.

3,882,738
SIMPLIFIED FLUID CIRCUIT FOR SHIFTING A TRANSMISSION

Sidney J. Audiffred, Jr., Washington, and Harold A. Mathes, Tremont, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Dec. 3, 1973, Ser. No. 421,065
Int. Cl. F16h *57/10;* **F16d** *25/00*
U.S. Cl. 74—753 **10 Claims**



1. A fluid circuit for shifting a multispeed transmission having a first and second group of fluid pressure actuated drive establishing devices, wherein at least one of said first group of devices is pressurized to select the drive ratio through said transmission while at least one of said second group of devices is pressurized to select the drive direction through said transmission, comprising:

a source of pressurized fluid,

a speed delector valve receiving pressurized fluid from said source through a first flow path and having means moveable to direct said fluid to any selected one of said first group of devices,

a directional selector valve having an inlet for receiving pressurized fluid and having valve means moveable to

direct fluid from said inlet to any selected one of said second group of devices and being moveable to a neutral setting,

a pressure modulating valve having an inlet communicated with said first flow path, and having flow controlling means moveable to control the pressure of fluid in said first flow path and further having modulating means shiftable to exert a changing force on said flow controlling means for gradually raising said fluid pressure in said flow path,

means forming a constricted fluid passage from said first flow path to said modulating means of said pressure modulating valve for gradually shifting said modulating means in response to rising fluid pressure in said first flow path, and

a safety differential valve having an inlet communicated with said first flow path and having an outlet communicated with said inlet of said directional selector valve and having a valve member moveable to control fluid flow from said inlet to said outlet, said safety differential valve having resilient means for uring said valve member towards a first position at which flow from said inlet to said outlet is blocked and having means for causing fluid pressure from said inlet to urge said valve member away from said first position towards a fluid metering position at which fluid may pass from said inlet to said outlet and having means for causing fluid pressure from said outlet to supplement the force of said resilient means on said valve member when said valve member is at said metering position whereby the pressure at said outlet is caused to have a predetermined relationship to the pressure at said inlet,

said safety differential valve further having means on said valve member thereof for relieving said fluid pressure at said outlet when said valve member shifts from said metering position towards said first position in response to a predetermined pressure drop at said inlet and having reset means on said valve member for relieving said fluid pressure on said modulating means when said valve member shifts in the opposite direction past said metering position in response to a subsequent pressure rise at said inlet following said relief of said pressure at said outlet.

3,882,739

DRIVE UNIT WITH AN INTERNAL COMBUSTION ENGINE AND WITH AN AUTOMATIC CHANGE-SPEED TRANSMISSION CONNECTED IN THE OUTPUT THEREOF

Georg Eltze, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Nov. 16, 1972, Ser. No. 307,198

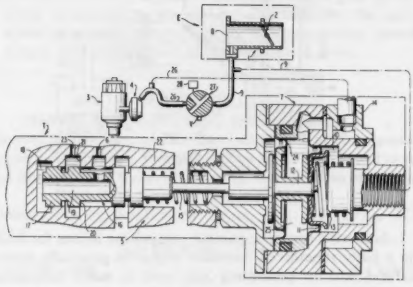
Claims priority, application Germany, Nov. 17, 1971, 2157028

Int. Cl. B60k *23/00*

U.S. Cl. 74—867 **12 Claims**

1. A drive unit arrangement with an internal combustion engine, an automatic change-speed transmission connected in the output of the internal combustion engine, an externally controlled ignition for operating the internal combustion engine, a suction pipe provided on the internal combustion engine in which the vacuum varies with the engine load, the change-speed transmission including shifting means for controlling the shifting operation in dependence on the engine load, a modulating pressure means influenced by the vacuum in the suction pipe for effecting the shifting operation, the arrangement comprising: ignition-adjusting means for adjusting the ignition for "delayed" ignition for the purposes of exhaust decontamination, and means operatively connected with said ignition-adjusting means for controlling the magnitude of the modulating control pressure upon adjustment of said ignition adjustment means toward "delayed" to correspond to the reduction of the engine torque which occurs as a result of the ignition adjustment.

12. A drive unit arrangement which includes an internal combustion engine, an automatic change-speed transmission connected in the output of the internal combustion engine, a vacuum means provided on the engine, means varying the vacuum in dependence upon the engine load, the change-speed transmission including automatic shifting means, modulating pressure means responsive to the engine load, the engine being further provided with an ignition distributor means and adjusting means for adjusting the engine ignition for "delayed" ignition for purposes of decontamination of the exhaust gases under certain circumstances resulting in a decrease of the engine torque, the arrangement comprising: means for controlling the magnitude of the modulating pressure, means operatively connected with said control means for operating the same to provide a modulating pressure corresponding to the reduction of the engine torque established by the adjusting means when the latter adjusts the ignition to "delayed" ignition.



3,882,740

PROCESS FOR CONTROLLING THE WORKING OIL PRESSURE AS A FUNCTION OF ENGINE TORQUE FOR SHIFTING ELEMENTS OF AUTOMATICALLY SHIFTED TRANSMISSIONS, ESPECIALLY FOR MOTOR VEHICLES

Hans-Joachim M. Förster; Hans Steinbrenner; Georg Eltze, all of Stuttgart, and Hans-Jörg Florus, Goppingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed June 30, 1972, Ser. No. 268,112

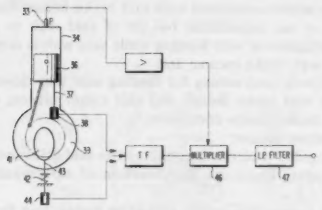
Claims priority, application Germany, June 30, 1971, 2132397

Int. Cl. B60k ; F16h *3/74*

U.S. Cl. 74—866 **34 Claims**

1. A method for controlling the working oil pressure as a function of torque of an engine for shifting elements of automatically shifted change-speed transmissions comprising the steps of producing a signal having a value representative of torque of the engine, producing at least one function magnitude signal having a value representative of at least one operating characteristic of one of the transmission and the engine, applying the torque signal and the at least one function magnitude signal to logic circuits for controlling the torque signal in

accordance with the function magnitude signal to provide an output signal, and applying the output signal to the shifting



element for controlling the working oil pressure for the shifting elements of the transmission.

3,882,741

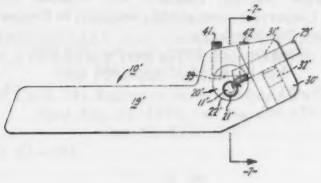
SUPPORT- AND -CUTTING-TOOL ASSEMBLY

Lloyd D. Cowdin, 563 Pala Ave., San Leandro, Calif. 94577

Filed Apr. 25, 1973, Ser. No. 354,347

Int. Cl. B23b *29/00*

U.S. Cl. 82—35 **6 Claims**



1. A support-and-cutting-tool assembly for machining elongated stock and like workpieces, comprising:

a. carrier shaving an opening therein adapted to be secured to the carriage of a lathe and be displaced thereby along an axially extending path having the collet of such lathe located adjacent one end thereof;

b. support block removably mounted within said opening and providing a passage of selective sizes to snugly fit the elongated stock being machined, said passage being axially disposed through said support block and alignable with such collet so as to be rotatably driven thereby; said support block being angularly displaceable within said opening about the center thereof and said passage is eccentrically disposed relative to said center;

c. cutting bit mounted upon said carrier;

d. and adjustment means for varying the relative positions of said cutting bit and passage to establish the depth of cut and amount of material machined from a workpiece extending through said passage, said adjustment means further including means for accurately adjusting the angular position of said support block relative to said carrier to establish accurately the position of said passage and any workpiece extending therethrough relative to said bit.

3,882,742

METHOD AND APPARATUS FOR BANDSAWING OPERATION WITH PROFILING MECHANISM CAPABLE OF AUTOMATIC COPYING OF A MODEL

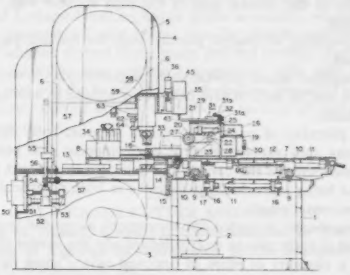
Toshihiro Fukami, Toyohashi, Japan, assignor to Fukami Co., Ltd., Toyohashi, Japan

Filed June 6, 1973, Ser. No. 367,568

Claims priority, application Japan, June 15, 1972, 47-059873

Int. Cl. B27b *13/10*

U.S. Cl. 83—56 **5 Claims**



1. A method of cutting a work by using a band sawing machine with a profiling mechanism incorporated therein and having a movable profile sensing member disposed in engagement with a work model having the desired profile on the outer periphery thereof, and a bandsaw blade deflection operating member adapted to function in response to the actuation of said profile sensing member, characterized in that it comprises the steps of converting the movement of said profile sensing member into an electrical signal which is a function of the quantity and the sense of movement of the profile sensing member, supplying said electrical signal to an electrical motor for causing a quantity and a sense of rotation thereof which is in relationship to said electrical signal, driving said bandsaw blade deflection operating member according to said quantity and the sensing of rotation of said motor, orienting said bandsaw blade to a required quantity of orientation by said blade deflection operating member in accordance with the given profile of the work model around the cutting edge portion of said bandsaw blade as the center of said orientation, and feeding back the orientating motion of said bandsaw blade to said profile sensing member.

3,882,743

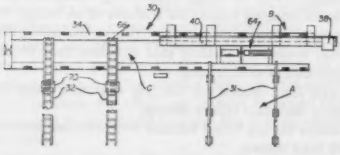
APPARATUS FOR MAKING SLOT DRAINAGE CULVERT

Ralph E. Evans, Middletown, Ohio, and Howard E. Blower, Oakland, Calif., assignors to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 307,137, Nov. 16, 1972, Pat. No. 3,815,213, which is a division of Ser. No. 60,516, Aug. 3, 1970, Pat. No. 3,714,786. This application Mar. 15, 1974, Ser. No. 451,435

Int. Cl. B23d *45/02*

U.S. Cl. 83—156 **8 Claims**



1. An apparatus for making an open slot culvert, for positioning in a drainage area with the open slot at the top so that

any surface drainage water will flow through the slot and directly into the culvert, the culvert being satisfactorily backfilled by utilizing any suitable material with the upper surface of the drainage area being substantially on a level with the upper surface of the open slot of the culvert, of the type having a metallic, pipe section, split longitudinally along its upper side to form a narrow slot, and grate means secured in said slot, said grate means comprising two spaced, vertical bearing members substantially normal to the axis of said pipe section and extending longitudinally over the major portion of the length of said slot and being joined by spacer means substantially normal to said vertical bearing members and substantially at the neutral axis of the pipe section wall, which comprises:

a. a plurality of spaced, parallel rails for feeding pipe sections;

b. a support means substantially perpendicular to said rails, one end of each of said rails being affixed to said support means;

c. a plurality of pairs of opposed support rolls mounted along said support means, each support roll being inclined toward the center line axis of said support means and being individually adjustable in both a vertical and a horizontal plane;

d. saw means mounted for movement along the length of said support means over substantially the center thereof;

e. a plurality of pairs of opposed side clamps mounted along said support means, said side clamps being provided with adjustable clamp fixtures at the ends thereof, said side clamps of each pair being movable toward and away from each other from a first disengaged position, wherein they do not contact the sides of a pipe section on said support rolls on said support means, to a second engaged position, wherein they contact the sides of said pipe section;

f. means for moving said side clamps in each of said pairs from said first disengaged position to said second engaged position and back again; and

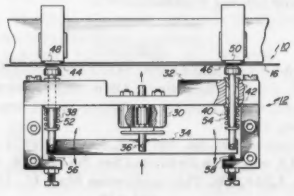
g. a plurality of spaced, parallel roller conveyors for removing fabricated culverts.

3,882,744

ELECTROSTATOGRAPHIC WEB FEEDING APPARATUS

Alan F. McCarroll, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 24, 1973, Ser. No. 391,176
Int. Cl. B26d *5/42*
U.S. Cl. 83—262 **8 Claims**



1. In electrostatographic web feeding apparatus for feeding downstream a web of image supporting material from a web supply to an imaging means for transfer of an image from said imaging means to said web in registration, including registered web cutter means for cutting said web into individual sheets, the improvement comprising:

first web feed means for feeding said web from said web supply into said cutter means;

said cutter means being located downstream from said first web feed means;

web brake means for rapidly and evenly stopping said web at said cutter means and preventing skewing of said web relative to said cutter means,

said web brake means providing, upon actuation, substantially simultaneous and automatically even pressure stopping engagement with said web at at least two spaced points transversely of said web,

said web brake means being actuated in conjunction with said cutter means;

bubble means associated with said brake means for formation of an expandable bubble of said web to prevent interruption of web feeding while said web is stopped by said web brake means; and

second web feed means for feeding said web downstream from said brake means and said cutter means; wherein said brake means comprises:

brake drive means;

an elongated teeter arm connected to said drive means and extending transverse the direction of movement of said web;

pivotal connecting means providing connection for movement by said drive means of said teeter arm toward said web, but free intermediately pivotable movement of said teeter arm relative to said web;

and at least two independent web engaging means, each including frictional web brake surfaces, respectively connected to said teeter arm on opposite sides of said pivotal connecting means for relative pivotal movement on said teeter arm relative to said web in response to uneven pressures on said web brake surfaces;

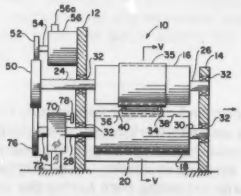
said web engaging means both being connected to said teeter arm for movement therewith toward said web by said brake drive means.

3,882,745

METHOD AND APPARATUS FOR ACCURATE DIE-CUTTING

Clyde Barner Garrett, Lanham, and William Stansbury Thayer, Lutherville, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 29, 1972, Ser. No. 319,163
Int. Cl. B23d *25/16;* **B26d** *1/56*
U.S. Cl. 83—311 **10 Claims**



1. Apparatus for controlling the accuracy of cuts made in a paperboard blank passing between a pair of cooperating die and anvil cylinders comprising:

first drive means for rotating said die cylinder at a first angular velocity;

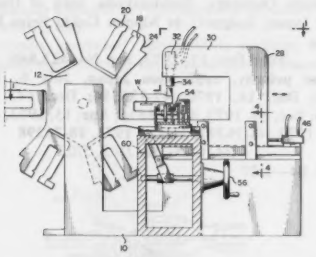
second drive means for rotating said anvil cylinder at a second angular velocity; and

selection means for controlling second second drive means to selectively change and maintain the second velocity equal to, faster, or slower than said first angular velocity; for controlling the velocity of said blank.

3,882,746
VERTICAL TURRET IRONWORKER

Dennis Daniels, Bellevue, Wash., assignor to U.S. Amada, Ltd., Seattle, Wash.

Filed June 5, 1974, Ser. No. 476,414
Int. Cl. B21d *28/26, 28/36;* **B26f** *1/04*
U.S. Cl. 83—552 **6 Claims**

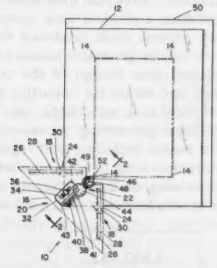


1. An ironworker having a base, a tool-carrying turret mounted on said base for rotation about a horizontal axis, a ram holder on said base, said ram holder having a striker for engaging a tool on said turret at a punching station beneath said striker and ram means for driving said striker against said tool, tool-support means aligned below said striker, means for moving said ram holder away from said punching station so as to allow passage of said turret for positioning a tool at said punching station and for moving said ram holder toward said punching station to align said striker and tool support with said tool, means for rotating said turret, and means for supporting a workpiece beneath said tool at said punching station.

3,882,747
DIMENSIONALLY AND ANGULARLY ADJUSTABLE TEMPLATE DEVICE FOR INTERIOR CORNER CUTTING OF PICTURE FRAME MATS

Othmar Carli, 341 Baltimore St., Gettysburg, Pa. 17325

Filed Aug. 12, 1974, Ser. No. 496,479
Int. Cl. B26d *3/02*
U.S. Cl. 83—561 **4 Claims**

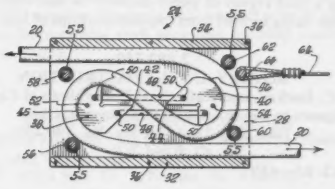


1. A dimensionally and angularly adjustable template device for interior corner cutting of the four corners of the window section of a picture frame mat, said device comprising in combination a dimensionally adjustable base plate member having guide slots therein disposed at a right angle to each other, an L-shaped cutting blade guide and support having as component elements thereof a threadably lockable slotted base member to which is perpendicularly attached a vertically extending leg member having a series of threaded holes therein along an arcuate pattern, said leg having a pivotally connected guide arm member attached thereto at one end of said guide arm member and at the other end thereof having a V-shaped slotted blade guide, a V-shaped blade sharpened at one end and slidably positioned within the slot of said guide, said blade having a handle on the opposite end thereof, a threaded wing bolt horizontally inserted through an opening in said guide arm member between the pivot point connection of said guide arm to said leg member and said slotted blade guide at the other end thereof whereby said guide arm by means of said pivoted connection to said leg member may be angularly adjusted relative to the vertical plane to a desired vertical angular setting and be securely locked in such adjusted position at one of various vertically angular position settings by means of rotatably inserting said wing bolt into one of said threaded holes in said vertically extending leg member of said L-shaped cutting blade guide assembly, whereby the blade assembly of said device may be slidably moved along said V-shaped slotted blade guide and the cutting edge of said blade assembly into cutting engagement with said picture frame mat and the handle of said blade then impacted to effect an interior corner cut for the window section of said picture frame mat.

3,882,748
CABLE CUTTER ASSEMBLY

Daniel M. Moore, Glendora, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1974, Ser. No. 454,654
Int. Cl. B26d *5/08*
U.S. Cl. 83—623 **10 Claims**

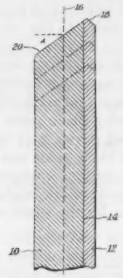


1. A cable cutter assembly comprising:
a support;
a pair of blocks, each of said blocks having a cutting edge at a foremost end of the block;
each of said blocks having a curved surface at an opposite end of the block from the cutting edge with the curve of the curved surface being in a plane which is substantially perpendicular to the respective cutting edge so that the cable can extend smoothly about the curved surface on an end of the block which is opposite from the respective cutting edge;
means mounting the pair of blocks on said support for individual slidable reciprocatory movement with the entire cutting edges located substantially coextensively in a single plane in a facing relationship and the curved surfaces facing in substantially diametrically opposite directions with respect to one another; and
the slidable reciprocatory movement being from an open spaced apart position of the cutting edges to a closed cutting position of the cutting edges so that in the spaced apart position the cable can extend between the cutting edges and in the closed position the cutting edges will cut the cable,
whereby upon placing the cable about the curved surfaces and between the cutting edges the cable will be cut when a predetermined loading of the cable has been exceeded.

3,882,749
BEAVERTOOTH CUTTING EDGE

James C. Tourek, 55 Samson Ave., Madison, N.J. 07940

Filed Oct. 10, 1973, Ser. No. 405,013
Int. Cl. B26d 1/00
U.S. Cl. 83—651 3 Claims

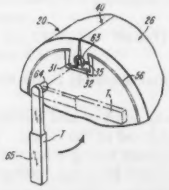


1. An elongated cutting member composed of at least two separate elongated sections of different and dissimilar metals or alloys disposed side by side, extending in the longitudinal direction of the member and bonded together along a common interface, which extends in said direction, one section being relatively thick and characterized by rapid wear during cutting, the other section being relatively thin and characterized by slow wear during cutting, one end of the member defining a cutting edge, said edge defining a line intersecting the longitudinal axis of the member at an acute angle and having a lead region or point disposed in said other section, the edge being formed from exposed portions of both sections.

3,882,750
ROTARY ANVIL CONSTRUCTION

John C. Duckett, and Rufus Neal Ensley, both of Clyde, N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed July 22, 1974, Ser. No. 490,458
Int. Cl. B26d 7/20, 7/26
U.S. Cl. 83—659 20 Claims

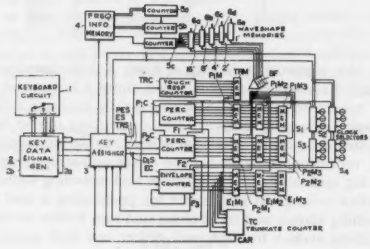


1. In combination: a rotary anvil having an outer substantially cylindrical surface and having a pair of spaced holding surfaces extending inwardly from said cylindrical surface and defining opposed walls of a longitudinal groove in said anvil, a die-cutting mat made of a compressible resilient elastomeric material attached against said anvil, said mat comprising a main central portion having opposite end portions provided with a pair of identical locking flanges extending from said end portions and being received within said groove, and a wedge between said flanges, said wedge having a major and a minor-sectional axis, said wedge having a comparatively large dimension across its major axis and being arranged substantially perpendicular said holding surfaces and thereby urging said flanges tightly against said holding surfaces to tighten and lock said mat against said anvil while simultaneously moving associated outer edges of said mat firmly against each other to provide a single line contact therebetween, said wedge having a comparatively small dimension across its minor axis and thus being adapted to be initially arranged between said flanges with its minor axis substantially perpendicular thereto, said wedge being adapted to be rotated approximately 90° to position its major axis and comparatively large dimension in said perpendicular arrangement.

3,882,751
ELECTRONIC MUSICAL INSTRUMENT EMPLOYING WAVESHAPE MEMORIES

Norio Tomisawa, Hamamatsu; Yasuji Uchiyama, Hamakita; Takatoshi Okumura, Toshiotakeda, both of Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha

Filed Dec. 11, 1973, Ser. No. 423,846
Claims priority, application Japan, July 6, 1973, 48-125513; Dec. 14, 1972, 47-125514; Dec. 14, 1972, 47-125515; Dec. 14, 1972, 47-125516; Apr. 13, 1973, 48-41964; July 6, 1973, 48-76397; July 6, 1973, 48-76398
Int. Cl. G10h 1/02, 5/02
U.S. Cl. 84—1.01 25 Claims



1. An electronic musical instrument comprising a key data signal generator which produces, in response to depression and release of a key, a key data signal corresponding to said key in a given key time period of a cyclically repeating plurality of key time periods, a key assigner including means which produce, upon receipt of said key data signal, a key address code corresponding to said key and means which concomitantly produce control signals indicating the depression and release of said key during said given key time period with respect to each of a number of channels which are portions of said time period shared by a maximum number of tones to be reproduced simultaneously, a musical tone waveshape generator means which produce a musical tone waveshape corresponding to the key address code produced from said key assigner, envelope waveshape generator means which produce an envelope waveshape upon receipt of the control signals from said key assigner and means for imparting said envelope waveshape to said musical tone waveshape, said key assigner, musical tone waveshape generating means and envelope waveshape generator means including shift registers having a number of stages corresponding to said number of channels for time-sharing processing of information in said channels and being driven in synchronization with each other.

3,882,752
CONTROLLED-DRIVE SEALING FASTENER

Charles E. Gutshall, Schaumburg, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Division of Ser. No. 222,576, Feb. 1, 1972, Pat. No. 3,788,185.
This application Oct. 25, 1973, Ser. No. 409,732
Int. Cl. F16b 43/00
U.S. Cl. 85—1 JP 6 Claims

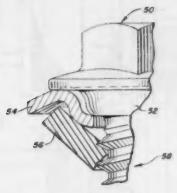
1. A controlled-drive sealing fastener comprising in combination:

a. an elongated shank threaded at least along a portion thereof and having an entering end at one extremity;

b. a head of expanded cross section integral with said shank adjacent the other extremity;

c. a centrally apertured, substantially rigid washer assembled on the shank adjacent to, and extending at least to the radial extremity of, said head, the aperture being sufficient in size to accommodate the shank adjacent the head but insufficient to pass the head and smaller than the maximum outer diameter of the threads on said threaded shank, said washer having at least an annular convex portion intermediate the radial peripheries thereof and disposed generally towards the head and a complementary annular concave portion disposed generally towards the entering end;

d. a centrally apertured, substantially resilient, normally flat-sided, right-circular cylindrical washer assembled on



said shank adjacent said substantially rigid washer and within the radial confines thereof prior to tightening of said fastener, the periphery of the aperture of said substantially resilient washer being stretched to resiliently grip said shank, outer portions of said substantially resilient washer being relatively unstretched prior to tightening of said fastener, the resulting differential stresses holding the normally flat-sided, right-circular cylindrical washer in a inverted generally frustoconical configuration relative to said substantially rigid washer and said head; said substantially resilient washer thus being disposed to sealingly engage said shank, said substantially rigid washer and an underlying workpiece surface upon tightening of the fastener thereagainst.

3,882,753

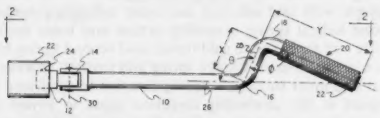
SPEED WRENCH TOOL

Charles R. Svensen, Rt. 2, Box 92, Philomath, Oreg. 97370

Filed Oct. 18, 1973, Ser. No. 407,644

Int. Cl. B25b *13/00*

U.S. Cl. 81—177 ST **2 Claims**



1. A speed wrench tool for single-handed rapid tightening of threaded fasteners by rotation thereof comprising a generally longitudinally-extending arm member, head means for releasably engaging a threaded fastener, coupling means for pivotally connecting said head means to an end of said arm member by a pivot axis permitting said arm member to be pivotally articulated between a position substantially collinear with the axis of rotation of said fastener and a position at substantially 90° thereto, an elongate grip handle at the other end of said arm member, and a zig-zag pair of coplanar bends in said arm member near the grip handle end thereof so as to present said grip handle end at an acute angle with and terminating proximate to the extension of the longitudinal axis of said arm member, said pivot axis of articulation being substantially in the plane defined by said pair of bends, whereby said grip end may be grasped and said arm member initially aligned substantially collinear with the axis of rotation of said fastener for rapid axial rotation and tightening of said fastener substantially by a wrist action alone, and said arm member thereafter pivoted substantially 90° therefrom for applying relatively high torque to complete the tightening of said fastener.

3,882,754

APPARATUS FOR PLAYING MUSICAL INSTRUMENTS

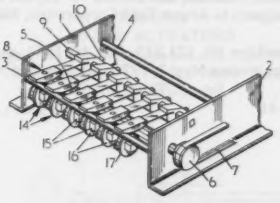
Kevin Michael Godley, 25 Sheepfoot Ln., Manchester, and Laurence Neil Creme, White Cottage, White Fold, New Mills, both of England

Filed Mar. 27, 1974, Ser. No. 455,424

Claims priority, application United Kingdom, Apr. 25, 1973, 19760/73

Int. Cl. G10d *3/16*

U.S. Cl. 84—320 **15 Claims**



1. An apparatus for playing a stringed musical instrument comprising: at least one rotatable member adapted for location on the instrument adjacent a string; a rotatable shaft having its axis located transverse to the strings and substantially parallel to the axis of rotation of the at least one rotatable member; means to continuously rotate the rotatable shaft; and manually operable means adapted bodily to move the rotatable member into peripheral contact with its adjacent string and the rotatable shaft such that the shaft causes said member to rotate.

3,882,755

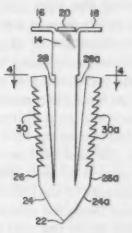
SHEET METAL DRIVE FASTENER

Robert Victor Enstrom, Oak Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 15, 1973, Ser. No. 416,302

Int. Cl. F16b *15/06*

U.S. Cl. 85—11 **5 Claims**



1. A one-piece fastener for piercing a sheet metal panel or the like and securing thereto an insulation sheet or the like; and comprising an arcuate shank portion with head means at one end thereof and with a piercing point portion having a substantially arcuate cross section located at the opposite end thereof; and a pair of planar wings diverging outwardly from the associated longitudinal side edges of the shank portion spacing the inner edges of the wings from the adjacent side edges of the shank portion for maximum resistance to movement of the wings in the planes thereof toward the adjacent edges of the shank portion when the fastener is driven to securing position, said wings diverging from the point portion toward and terminating short of the head means and having serrations along the outer edges thereof providing shoulders

for locking engagement with a panel after piercing thereof by the point portion, said wings lying generally in planes which include the side edges of the shank and said planes being generally tangent to the imaginary surface of revolution which includes the arcuate shank, said penetrating point adapted to form an arcuate slot which tends to force the wings inwardly toward the side edges of the shank and generally wedge in the arcuate configuration of the slot when the fastener is driven to securing position.

3,882,756

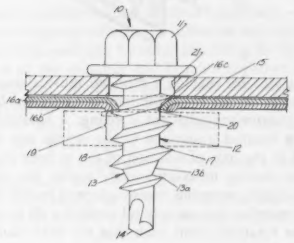
SELF PIERCING STRUCTURAL FASTENER HAVING A WORKING TRANSITION SECTION

Gilbert F. Sauer, Franklin, and Donald M. Taylor, Ross, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Continuation of Ser. No. 171,255, Aug. 12, 1971, abandoned. This application May 3, 1973, Ser. No. 356,934

Int. Cl. F16b *25/00*

U.S. Cl. 85—41 **2 Claims**



1. A self piercing structural fastener, for fastening relatively heavy gauge material to relatively light gauge material, comprising a threaded main body having constant major and root diameters of the thread of said threaded main body, said root diameter being about two-thirds of said major diameter, a drill point for initially piercing the light gauge material and the diameter of which drill point does not exceed approximately one-half the said major diameter of the said threaded main body, a tapered and threaded working transition section extending between said drill point and said main body, the length of said transition being at least the dimension of the said drill point diameter, the major and root diameters of the thread of said tapered and threaded transition section increasing gradually and uniformly from the said drill point diameter throughout the said transition section so as to blend respectively with the major and root diameters of said threaded main body, the said root diameter of said threaded main body being approximately one and one-third times the said diameter of said drill point, whereby said light gauge material is stretch-extruded as said transition section passes through the hole initially pierced by said drill point, and the pitch dimension of said threaded main body being sufficient to cooperatively receive the total thickness of said light gauge material as stretch-extruded by said transition section, whereby said stretch-extruded light gauge material will be in intimate contact with the said root diameter of said main body, and whereby said fastener may be passed through a preformed hole in said heavy gauge material of greater diameter than the major diameter of said main body and into the hole initially pierced in said light gauge material so that said main body may thread its way into said initially pierced hole as stretch-extruded by said transition section speedily and with a minimum of pressure while achieving good holding power.

3,882,757

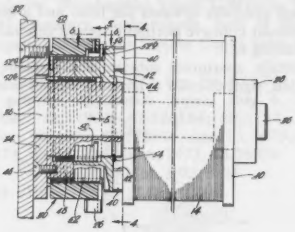
TEXTILE MACHINE CLUTCH

John H. Weatherby, Sewell, N.J., assignor to Warner Electric Brake & Clutch Company, Beloit, Wis.

Filed Feb. 11, 1970, Ser. No. 10,457

Int. Cl. D04c *3/14;* **F16d** *11/06*

U.S. Cl. 87—57 **2 Claims**



1. Apparatus for controlling the feed of a filament from a spool, said apparatus having, in combination, a frame, means for supporting a spool of filament on said frame for rotation about a predetermined axis, control means through which the filament passes as it leaves said spool, said control means including a tensioning device and an actuator movable in response to the tensioning device, a ring rigid with said frame and having a first outer cylindrical surface concentric with said axis, a brake member mounted on said frame to rotate about said axis and adapted to be drivingly connected to said spool, said brake member having a hub with a second cylindrical surface axially alined with said first surface, an annular member mounted on said brake member for rotation relative to the brake member and about said axis, a helical brake spring wound around both of said surfaces with one end anchored to said frame and the other end anchored to said annular member, said spring being stressed and of a hand normally to wind down on said surfaces to hold the brake member and hence the spool against turning, and a part rigid with said annular member and engageable by said actuator when said tensioning device is in a preselected position, said part being operable upon engagement by said actuator to turn said annular member in a direction to unwind said spring whereby said brake member and said spool are free to turn, said ring and said hub having axially alined inner surfaces concentric with said axis and said outer cylindrical surfaces, a second helical spring extending across said inner surfaces with one end anchored to said frame, said second spring being of the same hand as said brake spring and stressed to wrap out against said inner surfaces whereby rotation of the frame hub and spool in the unwinding direction tends to loosen said second spring and rotation of the frame hub in the opposite direction tends to tighten said second spring against said inner surfaces and hold the frame hub and said spool against turning.

3,882,758

TOOL SPINDLE HAVING A CLAMPING DEVICE FOR MILLING TOOLS

Johann Muller, deceased, late of Unterhaching, Germany (by Katharina Muller, legal representative), assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed May 11, 1973, Ser. No. 359,256

Claims priority, application Germany, May 29, 1972, 2226001

Int. Cl. B23b *5/26*

U.S. Cl. 90—11 A **9 Claims**

1. A tool spindle, comprising:

stationary hollow sleeve means;

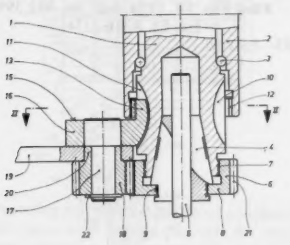
a hollow spindle rotatably supported in said stationary hollow sleeve means;

clamping means for clamping a tool mounted in said hollow spindle, said clamping means including a collet movable axially of said spindle to release and grip said tool therein;

a cap for holding said collet in said hollow spindle;

first fastening means for securing said cap to said hollow spindle;

second fastening means for securing said cap to said collet, said cap being rotatably supported for rotatable movement relative to said hollow spindle by said first fastening means and being further movable axially relative to said hollow spindle in response to said rotation thereof;



key means for connecting said hollow spindle to said hollow sleeve means to prevent said hollow spindle from rotating relative to said hollow sleeve means;

first toothed gear means supported for rotation on said key means and lever means for effecting a manual driving of said first toothed gear means for rotation; and

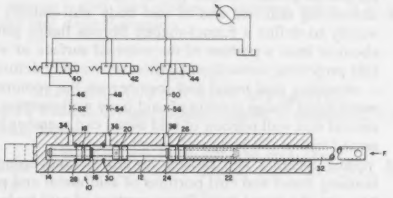
second toothed gear means mounted on said cap, the teeth of said second toothed gear means engaging the teeth of said first toothed gear means so that a rotation of said first toothed gear means will effect a rotation of said cap and a movement of said cap axially of said hollow spindle to move said collet relative to said hollow spindle.

3,882,759

FLUID ACTUATED CONTROL DEVICE

Charles William Formwalt, Cedar Falls; John Lewis Frank, Waterloo, and Allen Paul Schneider, Hudson, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 17, 1974, Ser. No. 434,090
Int. Cl. F15b *11/18*
U.S. Cl. 91—167 **12 Claims**



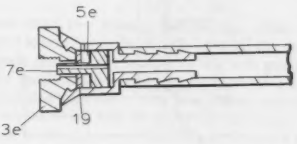
1. A fluid actuated control device comprising: a cylinder body having a longitudinally extending bore provided therein and open to one end; a piston rod of a diameter less than the diameter of the bore positioned in the bore; a first stop means on the inner end of the rod; a second stop means on the rod between and spaced from the first stop means and the outer end of the rod; a first piston slidably mounted in the bore and on the rod for relative movement between the first and second stop means; a third stop means on the outer end of the rod; a fourth stop means on the rod between and spaced from the second stop means and the third stop means; an additional piston slidably mounted in the bore and on the rod for relative movement between the third and fourth stop means; inner stop means in the bore limiting inward movement of the first piston; outer stop means in the bore limiting outward movement of the first piston; rod means operatively associated with the additional piston for movement therewith, slidably mounted in the bore and projecting from the one end thereof; first fluid passage means communicating with the bore inwardly of the inner stop means; and additional fluid passage means communicating with the bore between the outer stop means and the additional piston; and means for selectively supplying and exhausting fluid from either or both of the fluid passage means.

3,882,760

VALVE ACTUATORS

Roger D. Pass, 1119 W. Montana Ave., St. Paul, Minn. 55108

Filed Aug. 24, 1973, Ser. No. 391,502
Int. Cl. F15b *11/08*
U.S. Cl. 91—422 **2 Claims**



1. A valve actuator consisting of a casing having inlet and outlet connector means, a cylindrical chamber provided within said casing and vented to the outside atmosphere by a vent, a piston movably contained within said cylindrical chamber, a piston rod extending from one end of said piston and a flow passage extending through said piston and said piston rod, wherein said outlet connector means is capable of attachment to a tire valve, said piston and said piston rod are reciprocally operable by differential pressure, said piston rod is capable of extending through the outlet opening of said outlet connector means and is capable of depressing the spring biased valve core stem of a tire valve when the tire valve is in attachment to said outlet connector means, and said piston rod along at least part of its length is of a substantially smaller diameter than the diameter of said outlet opening of said outlet connector means, the lower portion of said piston rod having sealing means to provide an air tight seal between the lower outer circumferential portion of said piston rod and the inner circumference of said outlet opening only when said piston rod is at its forward limit of travel.

3,882,761

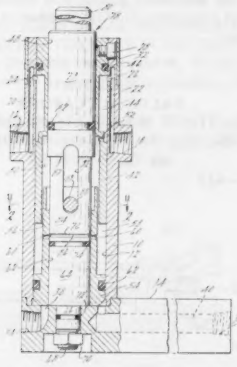
FLUID STOP MECHANISM

Joseph D. Snitgen, 18828 Hillcrest, Birmingham, Mich.

Filed Nov. 14, 1973, Ser. No. 415,815
Int. Cl. F01b *9/00*
U.S. Cl. 92—29 **11 Claims**

2. A fluid stop mechanism comprising a housing; a stop member reciprocally mounted for longitudinal movement in said housing and adapted to engage a workpiece or the like; expansible chamber motor means in said housing for moving said stop member into or out of engagement with a workpiece or the like, said motor means including a first expansible chamber; a second expansible chamber; a fluid chamber in said housing adapted to receive a substantially incompressible fluid; an element in said fluid chamber connected for movement with said stop member for altering the volume of said fluid chamber upon movement of said stop member; fluid control means having a passageway for controlling the flow of fluid between said fluid chamber and said second expansible chamber and being movable between an opened position

permitting flow in either direction through said passageway and a closed position wherein said passageway is moved out of communication with said fluid chamber and fluid is trapped in said fluid chamber to thereby become a locking fluid, said motor means being responsive to engagement of said stop member with a workpiece or the like to move said fluid control means from its opened position to its closed position upon such engagement for locking fluid within said fluid chamber to thereby resist movement of said stop member in a reverse



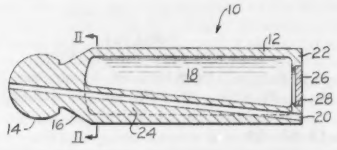
direction; a reservoir in said housing for supplying fluid to and from said fluid chamber, said reservoir having a fluid capacity at least as great as the maximum operable volume of said fluid chamber and communication means between said reservoir and said second expansible chamber, said communication means effecting a pressure in said second expansible chamber upon movement of said motor means, whereby a pressure differential is created between said second expansible chamber and said fluid chamber so that fluid will flow into said fluid chamber.

3,882,762

CAST PISTON WITH HOLLOW CORE AND HEAD COVER

Allyn John Hein, Joliet, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Nov. 23, 1973, Ser. No. 418,190
Int. Cl. F16j *1/08*
U.S. Cl. 92—181 **4 Claims**



1. A piston of the type generally used in hydraulic translating units, wherein said piston comprises a body comprising a generally elongate cylindrical body portion, a first end portion having a first face for engaging the piston to the hydraulic translating unit, and a second end portion having a second face and including an opening therethrough, means closing off said opening;

said cylindrical body portion defining a hollow cavity therewithin;

said elongate cylindrical body portion defining a rib extending from said first end portion to said second end portion and extending from the cylindrical body portion along its entire length inwardly of the cavity and formed as one piece with the cylindrical body portion whereby a u-shaped cavity is formed;

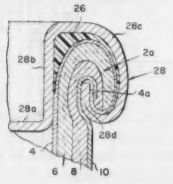
said rib defining an elongate passage therein longitudinally traversing the cavity from the first face on said first end portion to the second face on said second end portion.

3,882,763

METHOD FOR FORMING END SEAM CONSTRUCTION FOR COMPOSITE CONTAINERS

Donald H. Ellerbrock, Florissant, and John E. Bacon, St. Charles, both of Mo., assignors to Boise Cascade Corporation, Boise, Idaho

Filed Feb. 14, 1974, Ser. No. 442,399
Int. Cl. B31b *1/74*
U.S. Cl. 93—55.1 M **11 Claims**



1. The method of connecting a metal end member to the body wall member of a composite container, said metal end member including a central end wall portion, a generally tubular chuck wall portion connected at one end with and extending axially from the outer periphery of said end wall portion, an annular seaming panel portion connected at its inner periphery with the other end of said chuck wall portion, and a generally tubular inwardly-facing curl portion connected at one end with the outer periphery of said seaming panel portion and arranged in concentrically spaced relation about said chuck wall portion, said body wall member including a tubular layer formed of fibrous material, and a tubular inner liner layer formed of metal bonded to the inner wall surface of said fibrous layer, which comprises the steps of:

a. removing at at least one end of said body wall member a given length of at least the outer peripheral portion of said fibrous layer, whereby said metal liner layer projects axially said given length beyond the remaining outer peripheral portion of said fibrous layer;

b. deforming said one end of said body wall radially outwardly to define a funnel-shaped fibrous flange portion about at least a portion of the external surface of which said projecting metal liner portion is reversely deformed;

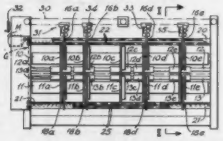
c. mounting said metal end member on the compressed metal-lined flange portion of said body wall member, the central end wall portion of said metal end member being seated within the body wall member; and

d. rolling together and radially-inwardly compressing the seaming panel and curl portions of said metal end member with the metal-lined flange portion of said body wall member, thereby to cause said metal-lined flange portion of said body wall member to be compressed between the curl and seaming panel portions of said metal end member, and the portion of said body wall member adjacent said flange portion to be compressed between the curl and chuck wall portions of said end member, the length of the projecting metal liner portion being such that said projecting liner portion is compressed in metal-to-metal surface engagement with at least that surface of said curl portion that faces the seaming panel portion of said metal end.

3,882,764
CASE MAKING MACHINERY

Frederick Paul Johnson, Audenshaw, England, assignor to Henry Simon Limited, Stockport, Cheshire, England

Filed Apr. 6, 1973, Ser. No. 348,612
Claims priority, application United Kingdom, Apr. 27, 1972, 19710/72
Int. Cl. B31b *1/14*
U.S. Cl. 93—58.2 R **14 Claims**



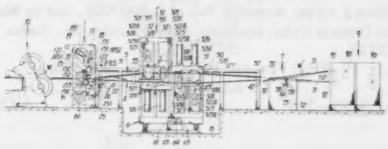
1. In a converting machine having a tool adapted to perform an operation upon work passed through the machine in a predetermined direction, a support for said tool, means mounting said tool for adjustment along said support laterally of said direction, an adjustment member mounted for displacement laterally of said direction and having a motion transmitting connection with said tool, an electric motor operably connected to said adjustment member and selectively operable to positively laterally displace said adjustment member for positioning said tool laterally of said direction, a tool positional control device mounted for movement laterally of said direction independently of said adjustment member, stop switch means in circuit with said motor and cooperating stop switch actuating means, one being mounted to be movable with said tool and the other being mounted to be movable with said device, directional switch means in circuit with said motor and cooperating directional switch actuating means, one being mounted to be movable with said tool and the other being mounted to be movable with said device, means for adjusting said device to set it in a desired position corresponding to that to be assumed by said tool and at the same time automatically setting said motor directional switch means so that when the motor is next energized it will effect movement of said tool in the required direction toward said desired position, and means for energizing said motor for adjusting said tool toward said desired position, said stop switch means and the switch actuating means therefor being so constructed and arranged that said motor is stopped when said tool reaches said desired position.

3,882,765
SLITTING AND SCORING APPARATUS

Masateru Tokuno, Hyogo, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Filed May 20, 1974, Ser. No. 471,792
Claims priority, application Japan, Sept. 21, 1973, 48-107279
Int. Cl. B26d *3/08, 11/00*
U.S. Cl. 93—58.2 R **6 Claims**

1. Slitting and scoring apparatus for slitting and scoring a web of material fed continuously in its running direction, comprising; a rotary shear capable of cutting off, at a stroke, the web transversely; a front guide plate for receiving the web at the outlet of the rotary shear and guiding the web rearward, front end of the front guide plate being faced close to the outlet of the rotary shear and rear end of the front guide plate being made to be raised and lowered at a stroke between its first position and its second position situated higher than the first position; an upper guide plate for receiving the web from the front guide plate with its rear end situated in said second position and guiding the web rearward, the front end of the upper guide plate is projected to said second position or between said first position and said second position, and the upper guide plate portion between the both ends thereof being provided with an opening; a lower guide plate for receiving the web from the front guide plate with its rear end situated in said first position and guiding the web rearward, said lower guide plate being placed below the upper guide plate, and the front end of the lower guide plate being projected towards said first position or a position below it, and the lower guide plate being provided with an opening; an upper slitter-scorer provided

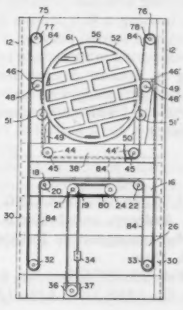


with more than two slitting and scoring units, each of the slitting and scoring units being able to enter the opening of the upper guide plate to slit and score the web guided into it by the upper guide plate or to get out thereof; a lower slitter-scorer provided with more than two slitting and scoring units, each of which being able to enter the opening of the lower guide plate to slit and score the web guided into it by the lower guide plate and to get out thereof; and a rear guide plate for receiving the slitted and scored web from the upper guide plate or the lower guide plate and guiding it rearward, front end of the rear guide plate being projected towards the rear end of the lower guide plate or a position below it.

3,882,766
AUTOMATIC OVEN

Abraham J. Matlen, 15347 Lauder, Detroit, Mich. 48227

Filed Oct. 15, 1973, Ser. No. 406,157
Int. Cl. A47j *37/04, 27/62*
U.S. Cl. 99—327 **5 Claims**



1. In an oven for automatically broiling and selfbasting foods including a support frame, an upper cooking station and a lower rest station both within the frame, said upper cooking station including opposed electrically operated heating means adapted to receive the food therebetween, the improvement comprising:

a rotatable food retainer; and

dual drive means including a closed-loop chain for operably engaging and continuously rotating said food retainer whereby the juice from the food being cooked therein self-bastes the food and only minimal amounts of juice are wasted;

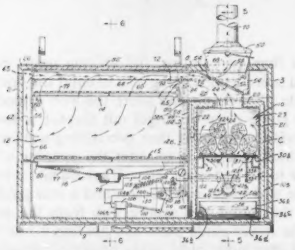
said dual drive means further including a counterbalance slidably mounted in said support frame and said chain further operably engages said counterbalance for selectively raising and lowering said food retainer between said cooking station and said rest station, whereby the sliding movement of said counterbalance regulates the effective length of said chain between a reference level and said food retainer thereby raising and lowering said food retainer, and whereby the food, when properly cooked, is lowered to said rest station.

3,882,767

AUTOMATIC COOKING APPARATUS

Herbert J. Oyler, deceased, late of Dallas, Tex., and by Margaret Frances Oyler, executrix, 5108 Elkridge Dr., Dallas, Tex. 75227

Filed Feb. 15, 1974, Ser. No. 442,968
Int. Cl. A21b *1/24;* **F24b** *7/04*
U.S. Cl. 99—339 **6 Claims**



1. Cooking apparatus comprising: a housing having a top, bottom, sidewalls, frontwall, backwall, and first and second outlet openings extending through said top; a partition in said housing forming a cooking compartment and a fire box compartment; a duct extending between said fire box compartment and said cooking compartment, said duct having an inlet passage communicating with said fire box compartment, a first outlet passage communicating with said first outlet opening extending through the top of the housing, and a second outlet passage communicating with said cooking compartment adjacent the top of the housing; a first damper in said first passage; a second damper in said second passage; a rack in said cooking compartment supported intermediate said top and bottom; and means having an exhaust passage formed therein, said exhaust passage communicating with said cooking compartment below said rack and with said second outlet opening in the top of the housing.

3,882,768

AUTOMATIC DONUT MAKING SYSTEM

George A. Troisi, Andover, and Julian D. Gordon, Marblehead, both of Mass., assignors to Dunkin' Donuts Incorporated, Randolph, Mass.

Filed Feb. 25, 1974, Ser. No. 445,430
Int. Cl. A21b *5/08;* **A21c** *13/02*
U.S. Cl. 99—352 **5 Claims**

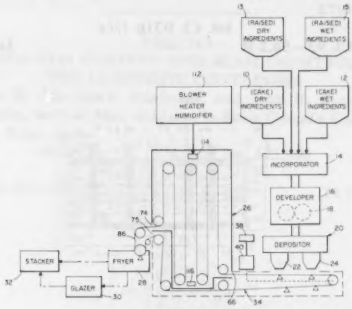
1. In a donut making system having discharge means for successively discharging shaped dough units, a proofer chamber providing predetermined conditions of temperature and humidity, and a fryer for cooking said dough units into donuts, the combination comprising

endless conveyer means having a first path portion effectively exposed within said proofer chamber and between said discharge means and said fryer, and a further path portion effectively not exposed within said proofer chamber and between said discharge means and said fryer,

reversible drive means connected to said conveyer means for driving said conveyer means in either of two directions, and

control means connected to said drive means for selecting either of two directions of drive,

whereby said dough units are moved from said discharge means through said first path portion effectively exposed within said proofer chamber for raising of the dough and



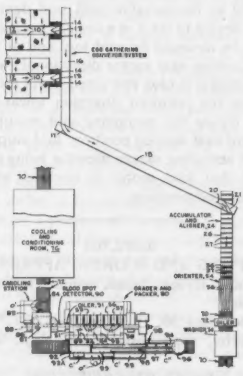
to said fryer when said conveyer means is driven in one direction, and said dough units are moved from said discharge means to said fryer through said further path portion effectively not exposed within said proofer chamber when said conveyer means is driven in the opposite direction.

3,882,769

EGG HANDLING SYSTEM

John R. Weber, 2102 Oak Crest Dr., Riverside, Calif. 92506; Richard L. Miller, Jr., 7460 Cabrillo Ave., La Jolla, Calif. 93501, and David R. Copple, 459 W. 11th St., Claremont, Calif. 91711

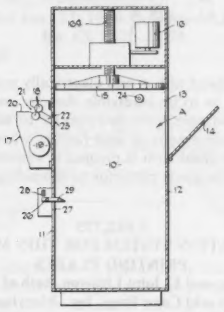
Filed Dec. 7, 1971, Ser. No. 205,561
Int. Cl. A23b *5/06;* **A01k** *43/00*
U.S. Cl. 99—484 **10 Claims**



1. An in-line egg handling system comprising a bulk conveyor means for automatically gathering eggs from the locations where they are laid, accumulating and aligning means where receiving eggs from said bulk conveyor means and for placing said eggs in a uniform arrangement, means for continuously conveying said eggs while they remain in said uniform arrangement, means for applying a first light coating of oil to the surface of said eggs, means for washing said eggs after said application of said first coating of oil, means for cooling said

eggs to an internal temperature in the range of from about 55°F. to about 65°F., means for applying a second light coating of oil to said eggs following the cooling thereof, and means for grading and packing said cooled eggs.

3,882,770
COMBINED SHREDDER AND BALER
Steven Francis Bleasdale, Huddersfield, England, assignor to Edwin Mills & Son Limited, Huddersfield York, England
Filed Aug. 31, 1973, Ser. No. 393,485
Int. Cl. B30b *15/14*
U.S. Cl. 100—49 **3 Claims**



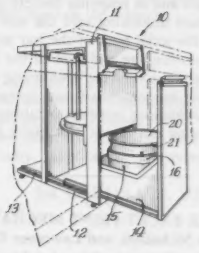
1. The combination comprising a baling machine for compressing paper and the like and shredding apparatus wherein: the baling machine comprises a body which defines a baling chamber and an inlet aperture in a lateral wall of the chamber, a ram which is mounted for vertical reciprocation in the baling chamber between an upper position in which it is situated above said inlet aperture and a lower position in which it is situated below the inlet aperture and ram drive means for causing said reciprocation of the ram,

the shredding apparatus comprises a pair of relatively rotatable cutters between which paper and the like can be fed to cut same into narrow strips, a discharge passageway leading from the cutters to said inlet aperture and shredder drive means for driving the cutters,

and there is further provided control means for so controlling operation of both said drive means that the cutters and the ram are not operated simultaneously, the control means including level detector means arranged in an upper portion of the baling chamber and responsive to accumulation of material in the baling chamber to a predetermined level to initiate operation of said ram and interrupt operation of said cutters.

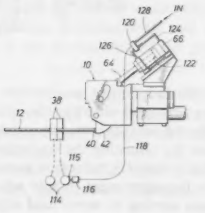
3,882,771
COMPACTOR APPARATUS
Edwin H. Frohbieter, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Sept. 4, 1973, Ser. No. 394,332
Int. Cl. B30b *1/18*
U.S. Cl. 100—53 **15 Claims**

11. Apparatus for compacting refuse comprising: a tubular sleeve; means defining an end wall; means for disposing the sleeve with one end adjacent the end wall; a ram; means for moving the ram through the sleeve for compacting refuse placed therein; and single powered means for moving the ram to a retracted position spaced from the compacted refuse and subsequently moving the sleeve from about the compacted refuse to about the retracted ram to dispose the sleeve in a



withdrawn disposition permitting access to the compacted refuse for withdrawal from the apparatus.

3,882,772
METHOD AND APPARATUS FOR IMPRESSING IDENTIFYING CHARACTERS INTO METAL BAR STOCK
Bernard H. Geisow, 443 Hollow Dr., Houston, Tex. 77024, and Lamon Harrelson, 12125 Palm Springs, Houston, Tex. 77034
Filed Jan. 19, 1973, Ser. No. 325,145
Int. Cl. B44b *5/00;* **B26d** *3/16*
U.S. Cl. 101—4 **10 Claims**



1. In combination with a bolt cutting machine, apparatus for impressing identifying characters on the end face of advancing bolt blank bar stock as the bar stock is supplied to said cutting machine, comprising

a die with selected identification characters thereon,

switch means connected to the cutting machine for generating a signal just prior to the time the cutting machine cuts the bar stock into a bolt blank,

a housing disposed in fixed relation to said bolt cutting machine,

a die positioning member supported by said housing, said die positioning member carrying said die and adapated for pivotal movement to position said die in the axial path of the advancing bar stock and to remove said die from the axial path of the bar stock,

a reciprocating drive means having a drive shaft attached thereto, said reciprocating drive means having signal responsive control means connected to said switch means and operating said shaft in response to said signals from said switch means,

toggle links being connected to said housing and to said die positioning member, said toggle links being connected to said drive shaft for positioning and locking said member and said die into the axial path of the advancing bar stock upon movement of said reciprocating drive means to a locking position thereof and unlocking and retracting said

member to position said die out of the axial path of the bar stock upon movement of said reciprocating drive means to an unlocking position thereof, and

said reciprocating drive means receiving said signal from said switch means and in response thereto moving to said unlocking position unlocking said die and repositioning said die out of the axial path of the bar stock to relieve said pressure between the end face of the bar stock and said die after impression of the identifying characters on the end face said movement of said reciprocating drive means to said unlocking position occuring just prior to the bar stock being cut into a blot blank by the cutting machine.

3,882,773

ADJUSTABLE FACET PRINT MECHANISMS

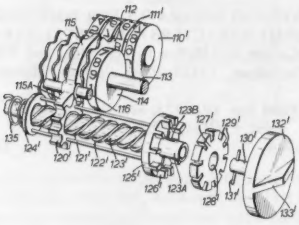
John E. Cook; Brian Nicholson, and Lawrence S. Dabbs, all of Boston, England, assignors to Norprint Limited, England

Continuation of Ser. No. 300,374, Oct. 24, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 444,852

Claims priority, application United Kingdom, Oct. 26, 1971, 49609/71

Int. Cl. B41j *1/60*

U.S. Cl. 101—110 **6 Claims**



1. In an adjustable-facet print mechanism, a plurality of print-facet carriers arranged side-by-side, each said carrier including a plurality of print-facets, adjustment means common to said carriers for adjusting the operative print-facet of a selected one of said carriers, selection means for selecting one of said carriers for adjustment by said adjustment means, said selection means serving to move said adjustment means relative to said carriers to a position wherein said adjustment means can act to adjust a selected carrier, and a single rotatable member common to both said adjustment means and said selection means and constituting the sole actuating member for both thereof, said single rotatable member being selectively axially displaceable between two positions and operable, in one of said positions, to operate only said selection means and, in the other of said positions, to operate only said adjustment means.

3,882,774

DEVICE FOR REVERSING THE DIRECTION OF DRIVE OF AN INKED RIBBON IN A HIGH-SPEED PRINTER

Albert Pfiz, Niederstotzingen, Germany, assignor to Walther Buromaschinen GmbH, Gerstetten, Germany

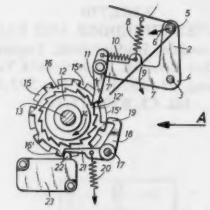
Filed Oct. 5, 1973, Ser. No. 403,780

Claims priority, application Germany, Oct. 6, 1972, 2249111

Int. Cl. B41j *33/516*

U.S. Cl. 101—336 **3 Claims**

1. A device for reversing the direction of drive of an inked ribbon in a high-speed printer for data processing machines and the like comprising a pivotally mounted crank arm having first and second lever arms, a guide pin extending laterally from said first lever arm and adapted to guide an inked ribbon thereon, a feed pawl pivotally mounted on said second lever arm, a rotatably mounted ratchet wheel and interconnected first and second cam wheels rotatable therewith, spring means continuously urging said feed pawl into engagement with said ratchet wheel, a cam lever operatively engagable by said cam wheels, a microswitch engagable by said cam lever to be actuated thereby, and a synchronous motor drivingly connected to said inked ribbon and electrically connected to said microswitch so as to be reversible thereby, said microswitch actuated by said cam lever in response to said cam wheels upon angular movement of said ratchet wheel by said feed pawl when said crank arm is pivoted in response to a pull by the ribbon on the guide pin prior to rewinding of the ribbon.



3,882,775

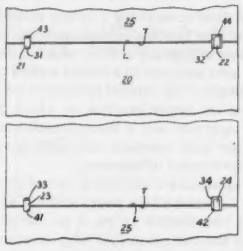
REGISTRATION SYSTEM FOR THIN MAGNETIC PRINTING PLATES

Gerald H. Lytle, and F. John Littleton, both of Effingham, Ill., assignors to World Color Press, Inc., Maryland Heights, Mo.

Filed July 2, 1973, Ser. No. 375,799

Int. Cl. B41f *27/02, 13/12*

U.S. Cl. 101—415.1 **1 Claim**



1. A registration system for accommodating printing plates in multiple around a plate cylinder comprising, in combination, a magnetic cylinder, a plurality of thin plates each having a magnetic backing and superimposed printing surface, each of the plates being of rectangular shape presenting straight axially facing ends and straight peripherally facing leading and trailing edges, the plates being dimensioned so that the leading and trailing edges of adjacent plates are spaced slightly edge to edge on the cylinder to define plate junctions, first and second pins at each junction, the pins being spaced to lie in the corner positions of the adjacent plates, each of the pins being of shallow height presenting flat axially facing surfaces as well as peripherally facing surfaces, the leading and trailing edges of each plate being notched to registeringly accommodate the pins, one of the notches in the leading edge of each plate being dimensioned to engage the two axial surfaces and a peripheral surface on its associated pin and the remaining notch in such edge being dimensioned to engage only a peripheral surface on its associated pin, one of the notches in the trailing edge of each plate being dimensioned to engage only the two axial surfaces of its associated pin while the remaining notch in such edge provides clearance in all directions about its associated pin, the pins all being peripherally elongated and centered on

the junctions to extend therefrom equally in both peripheral directions into the edges of the adjacent plates so that each pin while registered in notches of two adjacent plates performs differing functions on behalf of such plates, thereby to achieve register of the plates with freedom from buckling notwithstanding initial error in the spacing of the notches with respect to the pins and notwithstanding slight changes in the axial and peripheral dimensions of the plates occurring incident to a printing run.

3,882,776

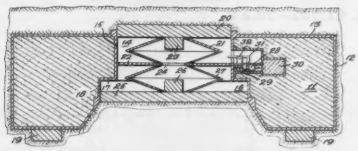
BLAST PROOF MINES

John Ewart Clemens, Xenia; Ben B. Johnstone, Dayton, both of Ohio, and Heinz E. Strohmeyer, Beverly, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1960, Ser. No. 78,191

Int. Cl. F42b *23/04*

U.S. Cl. 102—8 **2 Claims**



1. In a mine adapted to be implanted in the soil, said mine including an explosive charge and a cavity therethrough; an upwardly biased active member slidably mounted in said cavity; a downwardly biased preventive pressure member slidably mounted in said cavity, said preventive pressure member having a greater area than said active member; a firing mechanism for exploding said mine mounted in said mine and adapted to be activated by said active member upon a downward pressure applied thereon, and said preventive pressure member acting upon an air blast above the soil to prevent said active member from activating said firing mechanism.

3,882,777

CARTRIDGE FOR FIREARMS

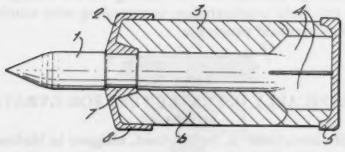
Gad Anders Rausing, Lund, Sweden, assignor to Ladco Enterprises Limited, Lund, Sweden

Filed Apr. 16, 1973, Ser. No. 351,313

Claims priority, application Switzerland, Apr. 20, 1972, 5163/72

Int. Cl. F42b *5/02*

U.S. Cl. 102—38 **4 Claims**



1. A cartridge for firearms comprising a projectile having a cross-sectional area smaller than the cross-sectional area of the bore of the weapon in which the cartridge is to be used and provided with an annular recess thereabout, a plurality of metal sabot sections forming together a sabot surrounding and engaging the annular recess of said projectile, said sabot sections when assembled including an annular recess on the rear face of said sabot, the outer circumference of said sections forming a close seal with the bore of the weapon and means of combustible material engaging the annular recess in the rear face of the assembled sabot sections for securing said sabot sections together around said projectile, said combustile securing means being consumed by combustion when the weapon is fired before the projectile leaves the muzzle of the bore whereby the sabot sections disengage from said projectile after leaving the bore of the weapon.

3,882,778

BLANK CARTRIDGE FOR TRAINING PURPOSES

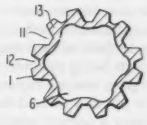
Heinz Gawlick, and Rudolf Stahlmann, both of Furth, Bay, Germany, assignors to Dynamit Nobel Aktiengesellschaft

Filed Mar. 21, 1973, Ser. No. 343,186

Claims priority, application Germany, Mar. 23, 1972, 2214092

Int. Cl. F42b *5/20, 5/30*

U.S. Cl. 102—39 **27 Claims**



1. Blank cartridge for training purposes comprising an elongated case of thermoplastic synthetic resin, said case forming an elongated hollow simulated projectile and a powder chamber, longitudinal extending rupturing means provided in the wall of said case and extending from the tip of said simulated projectile over at least substantially the entire length of said simulated projectile, said rupturing means being rupturable along the length thereof in response to a predetermined internal gas pressure, and longitudinal extending weakening means provided in the wall of said case for enhancing the deformability of said case, said weakening means being constructed so that the wall portion provided with said weakening means remains intact at the predetermined gas pressure.

3,882,779

EXPLOSIVE PROJECTILE

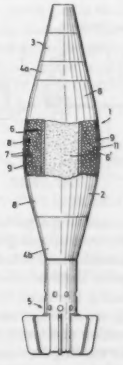
Amos Frostig, Haifa, Israel, assignor to Etablissement Salgad, Vaduz, Liechtenstein

Filed Mar. 21, 1973, Ser. No. 343,317

Claims priority, application Germany, Mar. 22, 1972, 2213832

Int. Cl. F42b *13/22, 13/48*

U.S. Cl. 102—49.1 **1 Claim**



1. A fin-stabilized projectile consisting essentially of

a. a frame structure including an elongated metallic tubular member, a conical head portion secured to one end of said tubular member and a cylindrical tail portion having

a plurality of radially projecting fins and secured to the opposite end of said tubular member, the diameters of said head and tail portions adjacent said tubular member being greater than the cross-section of said tubular member;

b. an explosive charge in the interior of said tubular member;

c. an annular solid body surrounding and being secured to said tubular member and extending between said head and tail portions, the circumferential surface of said body at the opposite ends thereof having substantially the same diameter as the adjacent parts of said head and tail portions respectively, and a portion of the circumferential surface spaced from and intermediate the ends of said body having a greater diameter than either end thereof and a greater diameter than the radial length of said fins from the axis of said tail portion, said annular body comprising a multiplicity of fragments uniformly distributed and embedded in a synthetic resin;

d. a protective, thin, fibrous, reinforcing, porous, net web embedded in the surface of said annular body, the composition of said web being selected from the group consisting of textile, glass and metal; and

e. said intermediate portion of said body having a greater diameter comprising a narrow annular ring member embedded in the surface of said body, said annular ring member being selected from the group consisting of metal and plastic and including a plurality of annular grooves in the circumferential surface thereof providing guide elements for said projectile;

f. said synthetic resin of said body and said thin porous web giving no appreciable resistance and the axial length of said ring member being insufficient to give appreciable resistance to acceleration of said fragments following detonation of said explosive charge.

3,882,780

RIFLE GRENADE, PARTICULARLY FOR FIRING TEAR GAS OR FLARE PROJECTILES

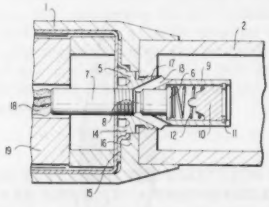
Heinz Gawlick; Rudolf Stahlmann, and Ernst Jensen, all of Furth, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Dec. 7, 1973, Ser. No. 422,724

Claims priority, application Germany, Dec. 7, 1972, 2259861

Int. Cl. F42b *13/46, 11/42*

U.S. Cl. 102—65.2 **26 Claims**



1. Rifle grenade comprising a grenade body, launching tube means disposed at one end of said grenade body, and detonator means for said grenade, said detonator means including an impact-initiatable igniter disposed proximate to the one end of the grenade body facing the launching tube means, a striker means for impacting on said igniter being spaced from said igniter in a safety position and being responsive to the launching of the grenade for moving forwardly toward said igniter to impact thereupon, delay means responsive to the initiation of said igniter for igniting material carried by said grenade body after a predetermined time delay, said delay means including a pyrotechnic delay train operationally disposed between said igniter and the material carried by said grenade body, said detonator means further including means for carrying said igniter, said carrying means including a member having a central continuous bore extending therethrough, said igniter being positioned in the bore from one end thereof and said pyrotechnic delay train being disposed within a sleeve member, said sleeve member being positioned at least partially within the bore from the other end thereof, said igniter and said delay train being spaced from one another within the central bore of said carrying means and said carrying means being provided with at least one gas discharge duct extending outwardly from the central bore in the region between said igniter and said delay train.

3,882,781

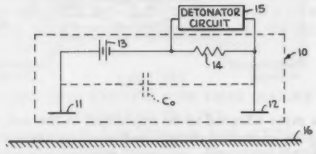
CAPACITANCE FUZE

Philip Krupen, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 14, 1962, Ser. No. 237,764

Int. Cl. F42c *13/00*

U.S. Cl. 102—70.2 P **1 Claim**



1. A proximity fuze comprising:

a. a first conducting body and a second conducting body, said first conducting body separated from said second conducting body, said first and second conducting bodies lying substantially in an edgewise relation on the outer surface of a projectile,

b. a source of direct current potential connected between said first conducting body and said second conducting body, said source of direct current potential establishing an electric field between said bodies with a positive charge on said first conducting body and a negative charge on said second conducting body, said electric field extending into the medium surrounding said conducting bodies and said projectile,

c. detonating circuit means including vacuum tube means having an anode, a cathode, and a grid, said first conducting body connected to said grid, and said second conducting body connected to said cathode, said detonating circuit means being responsive to a time rate of change in the charge on said bodies resulting from a change in the electric field configuration surrounding said conducting bodies and said projectile.

3,882,782

MECHANICALLY OPERATED FUSE FOR GYRATORY MISSILES

Robert Simmen, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Sept. 26, 1972, Ser. No. 292,293

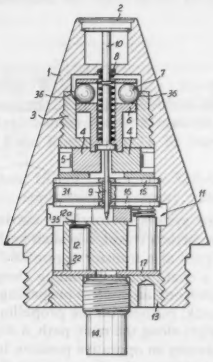
Claims priority, application Switzerland, Oct. 11, 1971, 14791/71

Int. Cl. F42b *15/22*

U.S. Cl. 102—79 **6 Claims**

1. A fuse for a gyratory missile comprising inside of a hollow body a detonator (14), a striker (9) adapted to move axially of the fuse towards said detonator, a primer-carrier (22), a pivot member (21) whose axis is located parallel with the path of movement of a striker and on which said primer-carrier (22) is pivotally mounted, said primer-carrier (22) movable

out of an inoperative position and into an operative position under the action of centrifugal force, the center of gravity (34) of said primer-carrier (22) when inoperative, lying on the side of a straight line connecting the axis of rotation of the fuse with the pivot member (21) of the primer-carrier (22), the effect of centrifugal force tending to maintain the primer-carrier (22) in inoperative position, a primer (12) extending through said carrier along a line parallel with said primer-carrier axis and assuming an operative position between the striker (9) and the detonator (14) when the primer-carrier (22) assumes its operative position, a spring (33) releasably



holding the primer-carrier in its inoperative position, a movable member (23) mounted on said primer-carrier pivot member above said primer-carrier (22) and in engagement therewith, said movable member (23) being shiftable centrifugally to thereby cause the primer-carrier (22) to enter a position for which the center of gravity thereof lies on the other side of said straight line and the primer-carrier is urged by centrifugal force into its operative position, and an escapement mechanism (29) cooperating with said movable member (23) to slow down its movement towards its centrifugally instigated position.

3,882,783

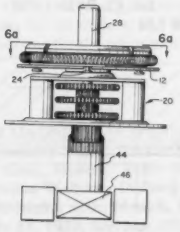
SPEED DISCRIMINATION CLUTCH

William H. Reams, Boonsboro, Md.

Division of Ser. No. 235,205, March 26, 1972, Pat. No. 3,804,222. This application Dec. 17, 1973, Ser. No. 425,428

Int. Cl. F42c *15/26*

U.S. Cl. 102—79 **6 Claims**



1. A centrifugal clutch for transmitting rotary motion from a first rotating shaft to a second rotatable member only when said first rotating shaft has an angular speed of a value between predetermined upper and lower angular speeds comprising:

a first circular plate fixed to said first rotating shaft and perpendicularly disposed thereto;

first means including at least one pivotally-mounted, spring-biased member having a shoulder formed on the outer edge thereof, said shoulder normally overlaying said first circular plate and extendable beyond the perimeter of said first plate only after said first plate is rotated at said predetermined lower angular speed;

a second plate coupled to said second member;

second means receivable of said first circular plate and first means, including at least one arcuate shoe having an inwardly-extending projection formed thereon, slidably coupled to said second plate for moving outwardly thereon only after said second plate is rotated at said predetermined upper angular speed; and

said second plate is coupled through a gear train to an explosive element normally in an out-of-line position in an explosive train,

said first means and said second means are adapted so that said shoulder contacts said inwardly extending projection when said first plate is rotating at a speed greater than said predetermined lower speed and disengages when said second plate rotates at a speed greater than said predetermined upper speed.

3,882,784

NITROESTER PROPELLANT, CASING, AND LINER OF AN EPOXY-POLYAMIDE COPOLYMER CONTAINING A STABILIZER

George W. Nauflett, Oxon Hill, and Craig E. Johnson, Indian Head, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 3, 1972, Ser. No. 270,794

Int. Cl. F42b *1/00;* **C06d** *5/06*

U.S. Cl. 102—103 **6 Claims**

1. A lined propellant device consisting essentially of:

a solid nitroester propellant;

a casing enclosing said solid nitroester propellant; and

a liner which coats the inner surface of said casing and which is in contact with said propellant; wherein said liner comprises (1) the cured reaction product of an epoxy resin having an epoxide equivalent of 170 to 800, a melting point of 55° to 165°C, a Gardner Holt viscosity (40 percent epoxy resin in butyl carbitol) ranging from D to J and a specific gravity from about 1.1 to 1.3, with a polyamide which contains free amine groups and has an amine value of 210–260, a viscosity at 40°C of 450–1400 poise and a specific gravity of 0.90–0.99, and (2) about 2 to about 10 percent, based on the weight of said liner, of a stabilizer selected from the group consisting of amyl alcohol, 2 nitrodiphenylamine, naphthalene, nitronaphthalene and a mixture of ethyl centralite and resorcinol in a ratio of from about 1:2 to 2:1.

3,882,785

METHOD AND APPARATUS FOR SETTING RAILROAD TIE PLATES

Delton James Rowe, R.F.D. 2, Syracuse, Nebr. 68446

Filed Feb. 28, 1974, Ser. No. 446,603

Int. Cl. E01b *29/24*

U.S. Cl. 104—16 **4 Claims**

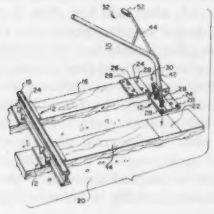
1. A method of setting railroad tie plates onto ties of a railroad track comprising the steps of:

placing railroad tie plates on ballast material near railroad ties;

inserting at least one elongated pointed member through at least one aperture in the tie plate and into said ballast material;

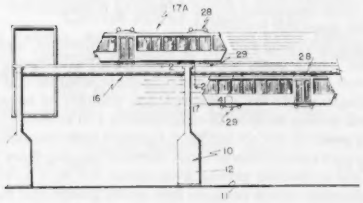
lifting said elongated member and said tie plate;

positioning said tie plate over a railroad tie with said pointed, elongated member; and



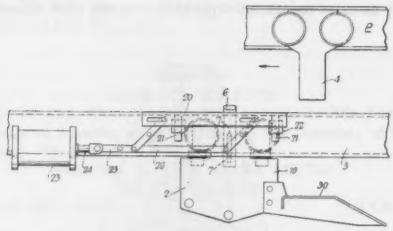
permitting said tie plate to slide from said elongated member.

3,882,786
TRANSIT SYSTEM
Gordon Woligrocki, 170 Scotia St., Winnipeg, Manitoba, Canada
Filed May 14, 1973, Ser. No. 359,766
Int. Cl. B61b *3/00*
U.S. Cl. 104—89 **7 Claims**



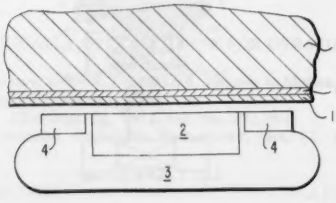
1. A transit system comprising in combination a plurality of support columns spacially disposed from one another and anchored to a support medium, a pair of spaced and parallel rail assemblies spanning said support columns above said supporting medium, said rail assemblies including upper and lower vehicle carrying surfaces, and at least one transit vehicle, said vehicle having at least one wheeled bogey on the upper side thereof and at least one wheeled bogey on the under side thereof, said wheeled bogey on the under side thereof engaging said upper vehicle engaging surface of said rail when said vehicle is running on said upper vehicle engaging surfaces, said wheeled bogey on the upper side thereof engaging said lower vehicle engaging surface when said vehicle is running on said lower wheel engaging surfaces, said rail assembly including said upper vehicle surface being substantially planar, and flanged wheels on said wheeled bogey on the under side of said vehicle, said rail assembly including said lower vehicle engaging surface having a major vertical leg portion, a planar portion extending by one side thereof from the lower end of said major leg portion and a minor leg portion extending upwardly from the other side of said planar portion in spaced and parallel relationship to said major leg portion.

3,882,787
CONVEYOR SYSTEMS
John Turner, Argyle Works, Stevenage, England, assignor to Geo. W. King Limited
Filed Mar. 13, 1973, Ser. No. 340,836
Claims priority, application United Kingdom, Nov. 26, 1972, 53050/72
Int. Cl. B65g *17/42*
U.S. Cl. 104—96 **9 Claims**



1. A conveyor system, comprising carriers, a main path along which the carriers travel, a branch path which branches from the main path at a transfer region and along which the carriers travel, a chain track extending along said main path at a spacing therefrom, an endless propelling chain supported by said chain track, pushers on the propelling chain arranged to push the carriers along the main path, a dog on each carrier displaceable between an operative position in and an inoperative position out of the path of movement of the pushers, and a dog-operating member movable to displace the dogs between their operative positions and their inoperative positions, and means which is actuated by a carrier in said transfer region when a leading portion of the carrier takes said branch path, but not by a carrier in said region continuing on said main path, to move said dog-operating member from an initial position to displace the dog on the carrier between its operative position and its inoperative position, and which is actuated by the carrier when a trailing portion of the carrier leaves said main path to return said dog-operating member to said initial position.

3,882,788
ELECTROMAGNETICALLY DRIVEN HIGH-SPEED ELEVATED RAILWAY CAR SYSTEM
Michael Simon, Reginbaldstrasse 4, 8 Munich-Obermenzing, and Rolf-Dieter Rose, Kochstrasse 11, 85 Nurnberg, both of Germany
Filed Oct. 27, 1972, Ser. No. 301,294
Claims priority, application Germany, Oct. 29, 1971, 2153928
Int. Cl. B61b *13/08*
U.S. Cl. 104—148 LM **16 Claims**



1. An electromagnetically driven high-speed elevated railway system arrangement having a vehicle arranged for guiding movement along guide beam means, comprising linear induction motor means including first and second cooperating parts

and a separate lifting means including first and second cooperating parts for spacing the vehicle from the guide beam means, the first part of each of the motor means and lifting means being mounted on the guide beam means, and the second part of each of the motor means and the lifting means being mounted on the vehicle and being positioned with respect to the respective cooperating first part such that the distance between each of the first and second cooperating parts of the motor means and lifting means increases upon failure of the lifting means, each of the second parts of the motor means and the lifting means being a magnet means, and the magnet means of the motor means and the lifting means being positioned in line one behind the other in the longitudinal direction of the vehicle.

3,882,789

ELECTROMAGNETICALLY OPERATED OVERHUNG AND/OR UNDERHUNG SUSPENSION VEHICLE

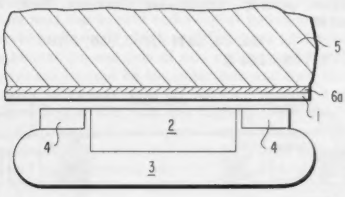
Michael Simon, Reginbaldstrasse 4, 8 Munich-Obermenzing, and Rolf-Dieter Rose, Kochstrasse 11, 85 Nurnberg, both of Germany

Filed Jan. 15, 1973, Ser. No. 323,415

Claims priority, application Germany, Jan. 15, 1972, 2201923

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 MS **22 Claims**



1. An electromagnetically operated suspension vehicle which is operatively associated with a guide-way means and which includes an asynchronous linear motor means and lift magnet means cooperating with reaction rail means and including electrical coil means characterized in that the guide-way means has an underside and in that the lift magnet means and the linear motor means together with the reaction rail means with which they cooperate are arranged on the underside of the guide-way means in such a manner that the vertical distance between the lift magnet means and the linear motor means, on the one hand, and the reaction rail means, on the other, will increase in case of failure of the lift magnet means, and further characterized in that the same electrical coil means are used for the lift magnet means and the linear motor means and in that a d.c. current generating a d.c. field is provided for producing the lift while an a.c. current producing a traveling a.c. field serving for the propulsion is superimposed on the d.c. current.

3,882,790

RAIL SYSTEM FOR MAGNETIC SUSPENSION VEHICLES

Günther Winkle, Munich; Peter Schwärzler, Furstenfeldbruck; Peter H. Otto, Munich; Peter Molzer, Herbertshausen, and Christian Walkner, Dachau, all of Germany, assignors to Krauss-Maffei A.G., Munich, Germany

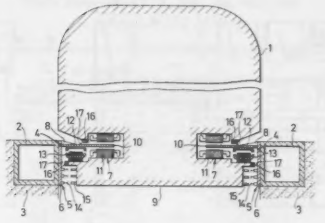
Filed July 13, 1973, Ser. No. 378,966

Claims priority, application Germany, July 17, 1972, 2235036; Jan. 25, 1973, 2303552

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 MS **2 Claims**

1. In a levitation-type vehicle system comprising a track and a vehicle displaceable along a path on said track, said vehicle including at least two of the elements (a) to (e), said elements being (a) electromotor means for propelling said vehicle along said track, (b) electromagnetic suspension means for magnetically supporting said vehicle on said track, (c) electromagnetic guide means for laterally positioning said vehicle relative to said track, (d) contact-shoe means for effecting an electrical connection between said track and said vehicle and (e) emergency support means engageable with said track upon failure of said electromagnetic suspension means, said track comprising a support extending generally continuously along the vehicle path and at least two generally continuous rail members respectively cooperating with said two elements of



said vehicle, the improvement which comprises mounting members common to said at least two rail members and anchored to said support at least at spaced-apart locations along said track, said rail members including an electromagnetic suspension armature rail cooperating with the electromagnetic-suspension means of said vehicle, a reaction rail cooperating with said electric motor means of said vehicle, a current-carrying rail cooperating with said contact-shoe means of said vehicle, and an emergency support rail engageable with said vehicle upon failure of the electromagnetic-suspension means all on said mounting members.

3,882,791

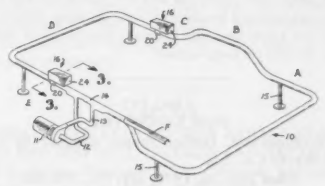
COMBINED FLUID AND MAGNETIC TRANSMISSION SYSTEM

Richard L. Youngscap, Lincoln, Nebr., assignor to ETS, Ltd., Santa Monica, Calif.

Filed Oct. 1, 1973, Ser. No. 401,997

Int. Cl. B61b *13/00*

U.S. Cl. 104—154 **7 Claims**



1. A system for transmitting mechanical energy from one location to another in a defined path, said system comprising, in combination

a conduit of nonmagnetic and nonmagnetizable material;

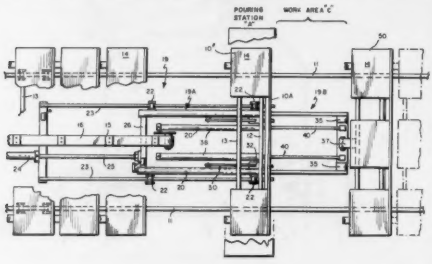
means for pumping fluid through the conduit;

a slug in the form of a stable, nondeformable ferromagnetic mass, said slug located within said conduit and free to move with said fluid and so shaped that it includes a portion which substantially conforms in cross sectional configuration to the configuration of the interior of the conduit whereby to inhibit any substantial by-pass of fluid past the slug thereby to cause the fluid to impart a velocity to the slug substantially equal to that of the slug; and

a permanent magnet located outside the conduit and supported for movement along the conduit, said perma-

nent magnet moving with the slug when the latter is in the magnetic field of the magnet.

3,882,792
AUTOMATIC PALLET CAR CONVEYOR
Edwin Ralph McIntier, Madison, Conn., assignor to Richard G. Sweitzer, Madison, Conn.
Filed May 3, 1974, Ser. No. 466,785
Int. Cl. B65g *25/10*
U.S. Cl. 104—162 **9 Claims**



1. An apparatus for automatically conveying pallet cars, each carrying at least one mold thereon, from a mold loading station to a mold pouring station, said apparatus comprising

means for moving said pallet cars from said loading station to a pick-up station;

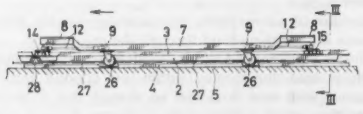
carriage means at said pick-up station, said carriage means including means for latching pallet car on to said carriage means so that the molds thereon are locked in position thereon;

means for moving said latched pallet car from said pick-up station to said pouring station, said movement causing the molds on said pallet car to be positioned at a preselected location at said pouring station and further causing a pallet car previously positioned at said pouring station to be moved therefrom to a position adjacent said pouring station;

means for further moving said carriage means to cause said previously positioned pallet car to be moved from said adjacent position to a position more remote from said pouring station and further to cause said latched pallet car to be unlatched from said carriage means whereby said unlatched pallet car and the molds thereon remain at said preselected location at said pouring station; and

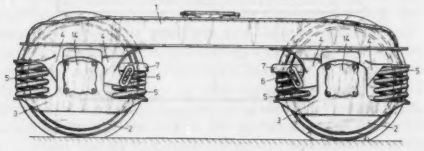
means for retracting said carriage means to its initial position at said pick-up station.

3,882,793
TOW CONVEYOR
Takao Wakabayashi, Osaka, Japan, assignor to Nakanishi Metal Works Co., Ltd.
Filed July 10, 1973, Ser. No. 378,005
Claims priority, application Japan, July 10, 1972, 47-69295
Int. Cl. B61b *13/00*
U.S. Cl. 104—170 **6 Claims**



4. A tow conveyor comprising the combination of at least one carrier, first rails disposed close to the floor, second rails disposed on the first rails in parallel thereto, an engaging means connected to the carrier pivotally movable in the horizontal and vertical directions and having rollers in rolling contact with the second rails, at least one trolley including rollers in rolling contact with the first rails, a drive means connected to the trolley to move the trolley along the first rails, and a pusher mounted on the trolley for engagement with the engaging means and projecting upward from the first rails to connect the carrier to the trolley and to thereby move the carrier along with the trolley, wherein the engaging means is positioned in front of the carrier and a disengaging means is provided in the rear of the carrier, the disengaging means being connected to the carrier pivotally movable in the horizontal and vertical directions and having rollers in rolling contact with the second rails, the trolley further including a pusher tilting dog mounted thereon in front of a pusher and projecting upward from the first rails to disengage the pusher from the engaging means by being pivotally forced down by the disengaging means of a preceding carrier and to thereby separate the carrier from the trolley, and which includes a fixing means for holding the engaging means and the disengaging means to the under face of the carrier, respectively.

3,882,794
SNUBBED AXLE RAILWAY BOGIE
Gerhard Stieler, Minden; Alfred Sinhoff, Wurselen; Otto Halmschlag, Oberforstbach, and Ferdinand Weckmann, Aachen, all of Germany, assignors to Waggonfabrik Talbot, Aachen, Germany
Filed Feb. 12, 1973, Ser. No. 331,546
Claims priority, application Germany, Feb. 10, 1972, 2206290
Int. Cl. B61f *5/36, 5/56, 15/06*
U.S. Cl. 105—224 R **12 Claims**



1. A bogie for rail vehicles, which includes in combination a bogie frame, a pair of wheel axles, axle bearing means for said axles, two pairs of helical springs respectively associated with said wheel axles, said bogie frame resting in said wheel axles through the intervention of said pairs of springs, housing means for said axle bearing means, guiding means arranged in said bogie frame for vertically and horizontally guiding said wheel axles together with said housing means for said axle bearing means to cushion and absorb the transverse shocks occurring during the drive of said bogie, said helical springs being arranged on one side of each of said housing means directly between said axle bearing guiding means and said axle bearing housing means, said spring means including an upper spring dish located on the other side of said housing means, spring link means inclined to the respective adjacent wheel axle and linking said spring dish to the axle bearing guiding means, pushrod means displaceably mounted in said axle bearing guiding means and operatively connected to said axle bearing guiding means through said upper spring dish so as to be adapted to be pressed against said axle bearing housing means, friction lining means having entirely separate friction surfaces interposed between said pushrod and said axle bearing housing means on one hand and said guiding means for said axle bearing means and said axle bearing housing means on the other hand for purposes of differently cushioning the vertical and horizontal movements of said housing independently for said axle bearing means, two carriages respectively arranged between said pushrod means and said axle bearing housing means and between said guiding means for said axle bearing means and said axle bearing housing means, and interengaging channel-shaped members separated by at least one pressure roller journalled to one of the members as pro-

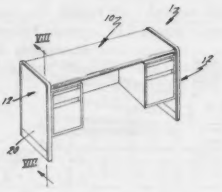
vided between each carriage and the pertaining axle bearing housing and adapted in vertical direction to roll therebetween.

3,882,795

TILTABLE DESK TOP

Donald D. Korell, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed June 1, 1973, Ser. No. 366,161
Int. Cl. A47b *13/00*
U.S. Cl. 108—1 **18 Claims**



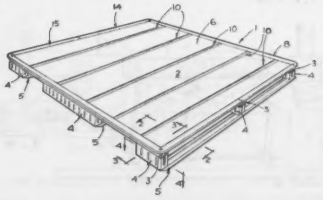
1. A desk, table or the like comprising: a top; an end support panel at each end of said top for supporting said top; fasteners for securing said top to said end support panels; cooperating means on said top for releasably cooperating with said fasteners to secure said top to said end support panel; said panels having apertures through which said fasteners pass whereby said top is located on one side of said end support panel and said fasteners are located on the other side and pass through said apertures to engage said cooperating means; a cover generally coextensive with said end support panel and being releasably secured to said end support panel, said cover covering said fasteners; said cover including means for releasing it from said end support panel whereby said cover can be removed to provide access to said fasteners; said cooperating means having at least two alternative cooperating positions for cooperating with said fasteners, a first in which said top is oriented generally horizontally and a second in which said top is oriented on a slope, said end panels having sufficient width and height that the ends of said top are concealed from view by said end support panel in either of said cooperating positions.

3,882,796

METAL PALLET

Joseph I. Andreini, Troy, Mich., and David P. Riley, Fairfield, Ohio, assignors to Metal Pallets Company, Cincinnati, Ohio

Filed July 2, 1974, Ser. No. 485,693
Int. Cl. B65d *19/28*
U.S. Cl. 108—51 **10 Claims**



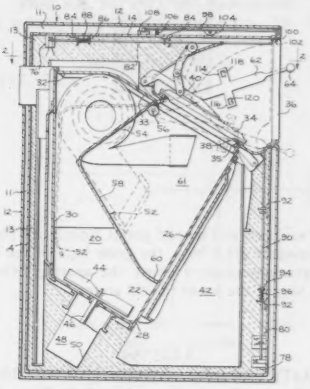
1. A metal pallet having a top deck of generally rectangular form, a plurality of runners, a plurality of legs and a bottom deck, said top deck consisting of a top skin of sheet metal having therein a plurality of elongate embossments, elongate reinforcing means cooperating with said embossments and rigidly attached to said top skin and a rim extending around the entire periphery of said top skin and rigidly attached to said top skin and to said reinforcing means, said runners being arranged in spaced parallel relationship transversely of said elongate reinforcing means and being rigidly attached to said top deck, said legs being rigidly attached to said runners and extending from said runners downwardly away from said top deck and said bottom deck being rigidly attached to the lower end of said legs.

3,882,797

EXPANSION GRATE FOR INCINERATOR

Christian A. Eff, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed June 20, 1974, Ser. No. 481,103
Int. Cl. F23g *5/10*
U.S. Cl. 110—8 E **8 Claims**



1. In an incinerator comprising a combustion chamber, a loading door for the incinerator, and heating means for incinerating combustible materials disposed within the combustion chamber, the improvement comprising:

an expansion grate disposed within said incinerator, said expansion grate being mounted in said incinerator for movement between a first position in which said expansion grate defines a loading chamber to limit the amount of combustible materials which may be placed in the incinerator and a second position in which said combustible materials are discharged from said loading chamber into said incinerator.

3,882,798

SECONDARY BED ELUTRIATION ARRESTOR FOR A FLUID BED DISPOSAL METHOD AND APPARATUS

Richard G. Reese, Woodside, Calif., assignor to Combustion Power Company, Inc., Menlo Park, Calif.

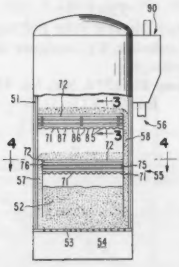
Continuation-in-part of Ser. No. 247,829, April 26, 1972, Pat. No. 3,818,846. This application June 24, 1974, Ser. No. 482,620
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 F **5 Claims**

1. In a waste disposal apparatus for consuming waste with minimal residue and a substantially pollution free gaseous output including a combustion housing, a bed of granular material, means for supporting the bed of granular material within the housing, means for providing combustion air to the bottom of the bed for maintaining the granular material in a fluidized state and an obstruction of labyrinth construction positioned within the housing above the bed, the improvement in the labyrinth construction comprising:

lower and upper vertically spaced-apart perforate retention plates,

at least first and second vertically spaced-apart grates positioned between said lower and upper plates,

means spacing said first and second grates from each other and from said lower and upper plates,



each of said first and second grates including a plurality of spaced-apart grate bars, the grate bars of the upper of said grates positioned above the spacing between the grate bars of the lower of said grates.

3,882,799

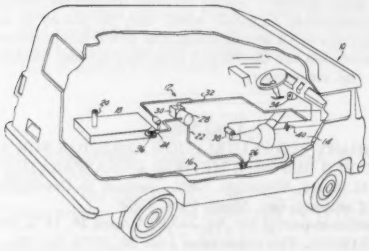
WASTE DISPOSAL SYSTEM AND METHOD

Charles L. Sargent, Ypsilanti, and John A. Hoffman, Brighton, both of Mich., assignors to Thermasan Corporation, Ann Arbor, Mich.

Division of Ser. No. 206,711, Dec. 10, 1971, abandoned. This application May 31, 1973, Ser. No. 365,511

Int. Cl. A47k *11/02*

U.S. Cl. 110—9 R **6 Claims**



1. In a waste disposal system for use with a fuel burning engine that discharges waste heated gases through an exhaust pipe, said exhaust pipe having an aperture in the wall thereof, waste injection apparatus comprising a screen in the form of a sleeve with an open end extending diametrically into said pipe through said aperture, a waste inlet conduit extending through said aperture into said screen and terminating a remote distance from the open end of the screen, and means for feeding waste material at a controlled rate through said waste inlet conduit.

3,882,800

AUTOMOTIVE UNIT FOR THE COLLECTION AND INCINERATION OF HOUSEHOLD OR INDUSTRIAL REFUSE

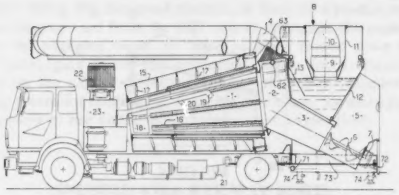
Michel G. J. du Chambon, Versailles, France, assignor to Locaner, Buthiers, France

Filed Feb. 13, 1974, Ser. No. 442,017

Claims priority, application France, Feb. 16, 1973, 73.05630

Int. Cl. F23g *5/06*

U.S. Cl. 110—14 **14 Claims**



1. An automotive unit for the collection and incineration of refuse, for instance household or industrial refuse, comprising a substantially fluid-tight incineration assembly in turn comprising a double walled rotary furnace substantially in the shape of a truncated cone and having one end forming a refuse charging hole and an other end forming an ash and incineration residue discharge hole, burners arranged in the furnace for the incineration of the refuse, an outer casing extending in coaxial relationship to the said furnace and turning jointly with the latter, said outer casing being closed at both its ends and extending beyond the furnace refuse charging hole so as to form an ash storage receptacle, means for charging refuse into the furnace and comprising a substantially fluid-tight device including an endless screw, a charging conduit substantially in the shape of a truncated cone between said endless screw and the charging end of the furnace for leading refuse advanced by said screw into the charging end of the furnace, a fume discharge sheath connected in a substantially fluid-tight manner to one end of the furnace, and means in operative communication with said sheath for the after-burning and cleaning of the fumes and combustion gases.

3,882,801

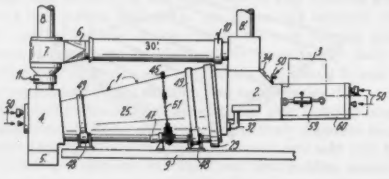
INCINERATOR FOR DOMESTIC AND INDUSTRIAL SOLID, SEMI-LIQUID OR LIQUID WASTE

Daniel Bolle, Geneva, Switzerland, assignor to Etablissement Manitra, Vaduz, Liechtenstein

Filed Nov. 16, 1973, Ser. No. 416,645

Int. Cl. F23g *5/06*

U.S. Cl. 110—14 **5 Claims**



1. An incinerator for domestic and industrial waste comprising, a frame, a rotary oven mounted on said frame, said oven being in the shape of a truncated cone, means for rotating said oven, a stationary pre-combustion chamber connected to one end of said oven and communicating therewith, a stationary post-combustion chamber connected to the other end of said oven and communicating therewith, burners associated with

each of said chambers, said precombustion chamber receiving said waste to be incinerated, an exhaust cyclone, gas exhaust ducts connecting each of said chambers to said cyclone, a damper isolating each of said chambers from the gas exhaust ducts and said cyclone whereby the burned gases may be directed against the direction of flow of waste or with the direction of flow of waste in the oven by the selective closing of one damper and the opening of the other damper or vice versa.

3,882,802

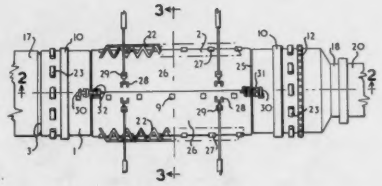
SOLID WASTE INCINERATOR

Earl A. Stewart, 29 Albert St., Aylmer East, Quebec, and William Joseph Gaboury, 111 Maple Grove Rd., Lucerne, Quebec, both of Canada

Filed May 20, 1974, Ser. No. 471,369

Int. Cl. F23g *5/06*

U.S. Cl. 110—14 **10 Claims**



1. A solid waste incinerator comprising an elongated cylindrical retort rotatable about a horizontal axis, rollers supporting said retort and means for rotating said retort on said supporting rollers, said cylindrical retort having a hatchway which extends in the circumferential direction along substantially one-half the circumference of the retort, and a closure for said hatchway which can be opened only at top center and bottom center positions for loading the waste material and unloading the burned material respectively, said closure, in its open position, permitting full passage of the material through said hatchway whose width is equal to the full interior diameter of said retort.

3,882,803

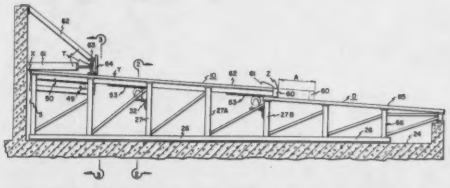
GRATE STRUCTURE FOR INCINERATION PLANTS

Grant L. Anderson, Ogden, Utah, and Wilbur W. Hish, Elgin, Ill., assignors to Clear Air, Inc., Ogden, Utah

Filed Apr. 18, 1974, Ser. No. 461,956

Int. Cl. F23b *1/22*

U.S. Cl. 110—18 R **9 Claims**



1. A grate installation for incinerator plants including, in combination, a reciprocable support plate structure having forward and rear ends and a receiving area proximate the latter for receiving materials dropped from above thereon; structural means for supporting said support plate structure for back-and-forth movements thereover; fixed upright reaction baffle means transversely disposed above said support plate structure proximate and rearwardly of the receiving area thereof; means for translationally reciprocating said support plate structure, said baffle means comprising the sole means, with the dropping of succeeding materials, for advancing prior-dropped materials forwardly along said support plate structure; and bed structure operably disposed forwardly of and overlapping underneath the forward end of said support plate structure, said support plate structure having transverse kicker plate means at its forward end for advancing forwardly materials dropping over said forward end of said support plate structure onto said bed structure.

3,882,804

TWO HOOK SEWING MACHINE NEEDLE FOR ROOTING HAIR AND AN APPARATUS FOR ROOTING HAIR

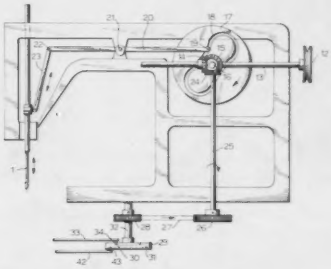
Yoshitsugu Matsumura, Nara, Japan, assignor to Kanegafuchi Chemical Industry Co., Ltd., Japan

Filed Aug. 24, 1973, Ser. No. 391,485

Claims priority, application Japan, Nov. 15, 1972, 47-132119

Int. Cl. D05c *15/02*

U.S. Cl. 112—79.5 **6 Claims**

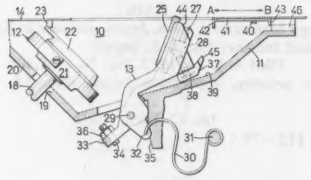


5. A hair rooting apparatus for rooting hair in a fabric-like material, comprising a needle having a pointed tip and a first relatively small hair engaging hook adjacent thereto of a size sufficient for engaging only a single or a few hairs from a bundle of parallel hairs, and a single further hair engaging hook spaced along the needle from the tip and having a size larger than said first hook sufficient for engaging double the number of strands of hair that are engaged by said first hook, needle raising and lowering means on which said needle is mounted for repeatedly lowering said needle to a lowest position, then raising it to an upper position, then lowering it to an intermediate position above said lowest position, and finally raising it to an uppermost position, a hair bundle holding means positioned below said needle at the lowest position of the needle tip and holding a bundle of hairs lying parallel to each other and transverse to the direction of raising and lowering movement of said needle so that the first hook extends into the bundle of hairs when the needle is at the lowest position, a pair of plates between said needle and said hair bundle holding means, one of said plates positioned slightly above the position of said further hook when said needle is in the intermediate lowered position and the other of said plates positioned slightly below the position of said further hook when said needle is in the intermediate lowered position, plate moving means on which said plates are mounted for moving said plates toward and away from each other in a direction perpendicular to the direction of raising and lowering movement of said needle and back and forth in a direction transverse to the movement of said plates toward and away from each other, said upper plate having a plurality of hooks at intervals along the edge thereof toward the lower plate and the lower plate having holes at corresponding intervals along the edge thereof toward the upper plate, the hooks and holes being aligned in the path of movement of said needle when the plates are in their closest position to each other.

3,882,805
HOOK GATE FOR FLAT BED SEWING MACHINES

Nereo Bianchi, Pavia, Italy, assignor to Necchi, S.p.A., Pavia, Italy

Continuation of Ser. No. 268,795, July 3, 1972, abandoned.
This application Nov. 7, 1973, Ser. No. 413,572
Claims priority, application Italy, July 20, 1971, 42956/71
Int. Cl. D05b 57/26
U.S. Cl. 112—180 3 Claims



1. A hook gate apparatus for flat bed sewing machines comprising:

a large recess formed in a sewing machine bed;

a hook gate body disposed in said recess at an inclined angle to the flat surface of said bed;

a latch bracket pivotally mounted in said recess for engagement with said hook gate body;

a sliding plate slideable on said bed over said recess and capable of covering and uncovering said recess;

contact means fixed to said sliding plate for coming temporarily into contact with said latch bracket during the sliding movements of said sliding plate from a closed to an open position and from an open to a closed position to initiate disengagement and engagement, respectively, of said latch bracket with said hook gate body, said contact means comprising a first member disposed on said sliding plate and extending vertically downwardly into said recess for temporarily contacting said latch bracket and a second member disposed on said sliding plate and extending vertically downwardly into said recess for contacting a stop member on said bed to limit the opening stroke of said sliding plate;

mounting means for said latch bracket at the bottom of said recess permitting said latch bracket to be swung within said recess from a closed to an open position; and

spring means attached to said bed and latch bracket to bias said latch bracket in a closed and open position.

3,882,806
COVER THREAD PULLING AND TAKE-UP DEVICE FOR MULTINEEDLE SEWING MACHINES

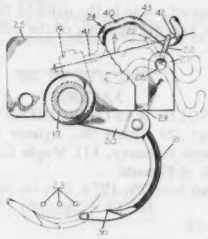
Nerino Marforio, Milan, Italy, assignor to S.p.A. Virginio Rimoldi & C., Milan, Italy

Filed Oct. 10, 1973, Ser. No. 405,033
Claims priority, application Italy, Oct. 20, 1972, 30712/72
Int. Cl. D05b 49/00
U.S. Cl. 112—243 4 Claims

1. A cover stitch device for sewing machines of the multi-needle type comprising:

a. an oscillatable drive shaft having an upper looper carried on one end of and moveable with said drive shaft;

b. a thread pulling element operatively connected to said drive shaft and movable with said upper looper in a first direction to draw and hold under tension a predetermined amount of cover thread from its source and in a second direction to release the cover thread to the upper looper

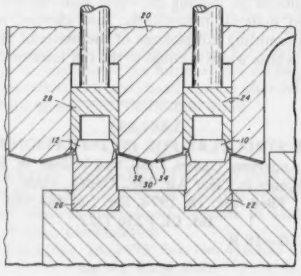


for its presentation to the stitches being formed by the needles of the sewing machine.

3,882,807
METHOD OF SEPARATING DUAL INLINE PACKAGES FROM A STRIP

Robert Matteson Montgomery, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 8, 1974, Ser. No. 458,943
Int. Cl. B21d 53/00
U.S. Cl. 113—119 2 Claims



1. A method of severing leads of adjacent lead frames which comprises the steps of:

a. providing at least a pair of adjacent lead frames on a ladder-like assembly, each lead frame having a plurality of leads of an essentially uniform thickness, the corresponding opposing leads of said adjacent lead frames being connected together through a a reduced-width section of said leads located essentially midway between the centerlines of said adjacent lead frames;

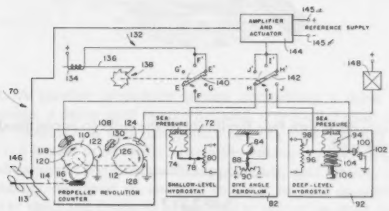
b. securing said pair of adjacent lead frames between form anvils and clamps leaving said opposing leads accessible; and

c. applying a force concurrently to all of said opposing leads in the region of said reduced-width section in a direction generally normal to the common plane of said adjacent lead frames until said leads rupture.

3,882,808
TORPEDO CONTROL

Robert E. Francois, Mountlake Terrace; William R. Davis, and Wayne M. Sandstrom, both of Seattle, all of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 30, 1962, Ser. No. 234,584
Int. Cl. F42b *19/00, 19/04*
U.S. Cl. 114—20 R 3 Claims



1. The method of effecting control and guidance of an anti-submarine torpedo of the type having a high yield warhead, said torpedo being launched from a hunter submarine against a submerged target submarine, said warhead when exploded beneath the surface of the water having explosive properties such that the maximum distance at which a predetermined damage inflicting effect occurs increases in a predetermined manner in accordance with the depth at which the warhead is exploded, said method comprising the steps:

a. placing the hunter submarine at a torpedo launching depth and launching the torpedo thereat and thereafter maintaining the hunter submarine at said depth or above until the warhead is exploded, said launching depth being above a predetermined depth from the surface of the water, said explosive properties defining a hunter submarine safety surface of revolution, said surface of revolution being generated by an upwardly convex curve, the upper end of which is rotated about the periphery of a circle on the surface of the water formed around a vertical axis passing through the hunter submarine, the volume of water within and the volume of water surrounding the hunter submarine safety surface of revolution constituting an unsafe-to-detonate volume of water, and a safe-to-detonate volume of water, respectively,

b. guiding the torpedo outwardly from the hunter submarine along a first substantially horizontal course,

c. guiding said torpedo downwardly and outwardly through the safe-to-detonate volume along a second slant dive course at a fixed dive angle after the torpedo travels across said surface of revolution and into the safe-to-detonate volume,

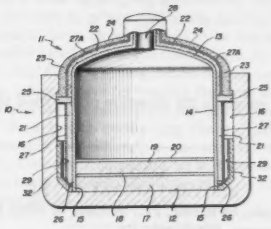
d. guiding the torpedo along a third horizontal course at a desired explosion depth after the torpedo dives to said explosion depth, said desired explosion depth being chosen to provide optimum damage inflicting effects upon the target submarine at various depths within said predetermined range of depths over which the target submarine may maneuver, and

e. detonating the warhead at a desired distance from the hunter submarine along said second or third courses within said safe-to-detonate volume.

3,882,809
STORAGE VESSEL FOR SHIP TRANSPORT OF LIQUEFIED GAS

Paul Richard Johnson, Oak Lawn; Elmer Weyman Rothrock, Hinsdale; Kenneth Wilson Lange, Burr Ridge; Willis James Kircik, Hinsdale, and Robert Newton Davis, Bolingbrook, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Nov. 30, 1973, Ser. No. 420,603
Int. Cl. B63b *25/08*
U.S. Cl. 114—74 A 16 Claims



1. In combination:

a ship having a hold with a bottom and walls; and

a tank, for transporting a cryogenic liquefied gas, having a structurally self-supporting wall and roof and which is spaced or separated from the ship hold walls;

said tank comprising a metal shell with a walled portion and a roof portion;

the walled portion having a horizontal circular bottom edge and a surface of revolution generated by the movement of a generatrix line which moves in a path touching the horizontal circular bottom edge and is constantly in the same spaced relationship to a straight vertical line perpendicular and central to the horizontal circular bottom edge;

the bottom edge of the walled portion being in direct contact with, and continuously joined to, the ship hold bottom;

a metal secondary bottom in the tank spaced above the ship hold bottom and extending to the shell walled portion;

means supporting the secondary bottom in position above the ship hold bottom;

insulation between the secondary bottom and the ship hold bottom;

a metal primary bottom in the tank spaced above the secondary bottom and extending to the shell walled portion; and

storage load support means supporting the metal primary bottom in position above the secondary bottom.

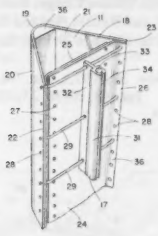
3,882,810
MAST WITH MOVABLE SAIL ATTACHING MEANS

John O. Roeser, Arlington Heights, Ill., assignor to Otto Engineering, Inc., Carpentersville, Ill.

Filed Feb. 25, 1974, Ser. No. 445,215
Int. Cl. B63n *9/08*
U.S. Cl. 114—112 10 Claims

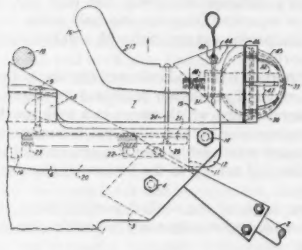
1. A mast comprising an elongated body having a top and a bottom and a forward portion and an aft portion, a pair of sides extending rearwardly from the forward portion, and sail-attaching means extending longitudinally adjacent the aft portion of the body and attached thereto for attaching a sail to the mast, the sail-attaching means including luff-attaching means for holding the luff of a sail and slide means extending transversely across the aft portion of the mast for slidably supporting the luff-attaching means for lateral movement said

luff attaching means whereby the luff-attaching means and the luff can move laterally from one side of the mast to the other



on the slide means as the direction of the wind relative to the mast changes.

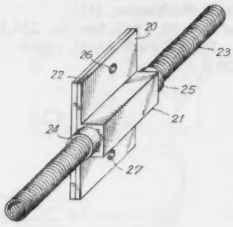
3,882,811
BUOYANT SIGNAL FLARE
Robert Temple, Swissvale, Pa., assignor to Mine Safety Appliance Company, Pittsburgh, Pa.
Filed Feb. 18, 1957, Ser. No. 640,754
Int. Cl. F42b *21/20*; B63b *9/00*
U.S. Cl. 114—221 A 16 Claims



16. A flare device for use with an explosively actuated mine anchor-line cutter, comprising a buoyant flare, and means for attaching the flare to such a cutter, said means being separable from the cutter by the firing of the cutter under water to sever an anchor-line, whereby the flare will be released, the flare including a gas-producing chemical, water-pressure responsive means sealing the chemical away from water as long as the flare is in deep water, and means for moving said water-pressure responsive means out of said sealing position when the flare rises out of said deep water.

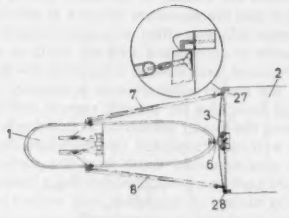
3,882,812
GAFF HOLDER
Anthony Tarantino, 364 Chestnut St., Ridgefield, N.J. 07657
Filed June 10, 1974, Ser. No. 477,555
Int. Cl. B63b *17/00*
U.S. Cl. 114—221 R 7 Claims

1. A gaff holder comprising:
a flexible tubing means of length greater than twice the distance from the tip of the gaff to the mid-point of the hook and of internal diameter sufficient to permit movement of said hook along said tube and a flexibility sufficient to grip said gaff when said gaff is disposed within the said tube;
a backing plate to mount said gaff holder;
a mounting means centrally located of said tube to mount said tube on said backing plate said mounting means being along the outer surface of said tube but occupying along said tube a distance less than that which would



interfere with free flexibility of the tube to accommodate the gaff.

3,882,813
WATERCRAFT COUPLING SYSTEM
Hans-Georg Janssen, Bremerhaven, Germany, assignor to Aktiengesellschaft "Weser", Bremen, Germany
Continuation of Ser. No. 104,249, Jan. 6, 1971, abandoned. This application May 21, 1973, Ser. No. 362,185
Claims priority, application Germany, Jan. 17, 1970, 2001996; Mar. 14, 1970, 2012289; Nov. 30, 1970, 2058738
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 R 1 Claim



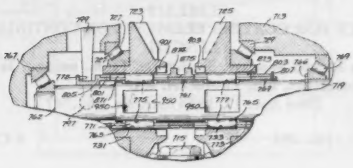
1. A watercraft coupling system, particularly for coupling tugs and barges, comprising a first watercraft having a bow; a second watercraft having a stern; a plurality of vertical guide tracks on said stern, including a center guide track and a pair of lateral guide tracks at opposite sides of said center guide track and located in the respective edge regions of the stern; a traverse member articulately connected to said bow and extending transversely of said guide tracks and having end portions located adjacent to the respective lateral guide tracks; guided elements mounted on said tranverse member and extending into the respective tracks, so that said traverse member is guided by all of said tracks for vertical displacement relative to said stern; elongated flexible coupling elements releasably secured to and extending along said first watercraft and having free ends located adjacent the respective end portins of said traverse member; and connecting means connecting each of said free ends with one of said end portions so as to move with said traverse member when the latter becomes displaced along said guide tracks in response to vertical movements of said watercraft relative to one another.

3,882,814

MARINE PROPULSION REVERSING MECHANISM

William J. Shimanckas, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 132,401, April 8, 1971, Pat. No. 3,818,855. This application Oct. 12, 1973, Ser. No. 406,014
Int. Cl. B63h *5/12*
U.S. Cl. 115—34 R 2 Claims



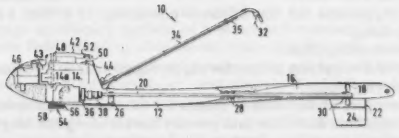
1. A marine propulsion device comprising a drive shaft housing, a drive shaft in said housing, a propeller shaft rotatably mounted in said drive shaft housing and drivingly connected to said drive shaft, a propeller carried by said propeller shaft, a power shaft rotatably supported by said device, a gear rotatably mounted in co-axial relation to and around said power shaft and drivingly connected to said drive shaft, means for drivingly connecting said power shaft to said gear including a roller having an axis extending parallel to the rotational axis of said power shaft and movable relative to a position of driving engagement between said power shaft and said gear, and means carried by said device for selectively displacing said roller relative to said position and comprising a roller retainer located between said power shaft and said gear, an actuator located between said power shaft and said gear, means on said actuator and on said power shaft for affording axial movement of said actuator relative to said power shaft and for preventing relative rotary movement between said actuator and said power shaft, means on said retainer and on said actuator for affording common axial movement thereof relative to said power shaft while affording relative rotary movement between said retainer and said actuator, engageable means on said retainer and on said gear, operable in response to axial movement of said actuator relative to said power shaft in one direction, for rotating said retainer relative to said power shaft to locate said roller in said position, and means on said power shaft and on said retainer, operable in response to axial movement of said actuator relative to said power shaft in the other direction, for disengaging said retainer from rotary engagement with said gear and for rotating said retainer so as to displace said roller from said position.

3,882,815

WATERCRAFT

David Bennett, Meipham, England, assignor to North Hants Engineering Company Limited

Filed July 18, 1973, Ser. No. 380,234
Claims priority, application United Kingdom, July 26, 1972, 34890/72; Oct. 11, 1972, 46942/72
Int. Cl. B63b *35/00*
U.S. Cl. 115—70 1 Claim



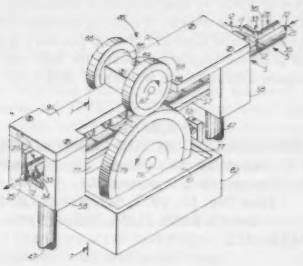
1. A watercraft comprising an elongate hull, an engine mounted in the forward part of the hull, the cross-section of the hull rearwardly of the engine having a width substantially greater than its depth to provide a craft user with an appreciable upper surface area on which to lay, sit or stand, a propeller shaft extending rearwardly of the engine and located in a housing provided by the hull, a propellor fixedly connected to the rear end of the propellor shaft, handle means connected to the hull by elongate tension means to enable the craft user to grasp the handle means while standing on said upper surface area, means enabling the engine to remain running for at least a limited period of time following inversion of the attitude of the craft, a fuel supply means having a main reservoir for supplying fuel under gravity to the engine carburettor when the hull is correctly afloat, and an auxiliary reservoir disposed below the main reservoir and in communication therewith via a tube depending downwardly therefrom, the tube being operable to retain fuel in the auxiliary tank when the hull is upside down to enable fuel to be fed under gravity from the auxiliary fuel tank to the carburettor, the main reservoir having a fuel filling opening, a non-vented cap for closing said opening, a bleed valve for venting the main reservoir, and wherein a bleed tube connects the top of the main reservoir with a fuel feed tubing connecting the carburettor to the auxiliary reservoir, and wherein a one-way valve is incorporated into the bleed tube to permit air to bleed from the feed tubing to the main reservoir when the attitude of the craft is corrected from an inverted position.

3,882,816

APPARATUS FOR FORMING LAYERS OF FUSIBLE METAL ON ARTICLES

David L. Rooz, Allentown; Ford J. Brown, Kutztown, and Richard J. Merwarth, Easton, all of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Sept. 22, 1972, Ser. No. 291,482
Int. Cl. B05c *1/02, 11/12*
U.S. Cl. 118—57 13 Claims



1. An apparatus for forming layers of a fusible metal on articles, comprising:

an elongated member forming an enclosure and having a surface and a slot formed in the surface and extending longitudinally along the member;

a strand-like member extending within the enclosure;

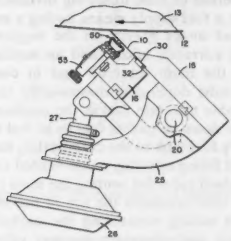
means for applying on each article a mixture of the metal and a flux;

means connected to the strand-like member and passing through the slot, including grooved portions supported by and engaging the edges of such slot, for mounting each article to the strand-like member;

means for heating at least the fusible metal of the mixture to melt it; and

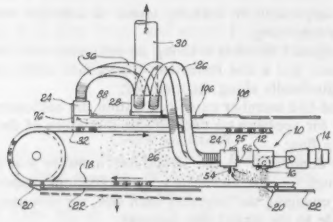
means for advancing the strand-like member along the elongated member to move the mounting means longitudinally along the slot to convey each article through the applying means to apply the mixture on each article, and to convey each article with the mixture thereon through the heating means to melt at least the fusible metal of the mixture and thereby form the layers of the fusible metal on the articles.

3,882,817
DOCTOR BLADE ASSEMBLY
Stanley C. Zink, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio
Filed Jan. 11, 1974, Ser. No. 432,504
Int. Cl. B05c *11/04*
U.S. Cl. 118—126 **7 Claims**



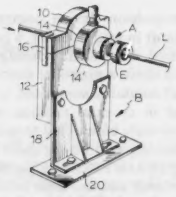
1. In a blade type coater in which a cantilever-supported blade is urged against a moving web to control the weight of the coating applied thereto, the improvement comprising a transversely elongated flexible tube, means supporting said tube adjacent said blade between the supported end and the free end thereof, said tube being formed with a collapsible wall section adjacent said blade and a blade-engaging extension which is formed with an integral part of said wall section, said extension being movable by said wall section transversely of said tube upon the application of fluid pressure thereto and engageable with said blade at a relatively fixed location on said blade, the effective area of said wall section subject to pressure remaining substantially constant with movement of said wall section, and the location on said blade upon the application of force by said extension remaining substantially constant so that the weight of coating applied varies approximately as an inverse function of fluid pressure applied to said tube, and pressure regulating means for applying a regulated fluid pressure source to the interior of said tube.

3,882,818
POWDER COLLECTOR CONSTRUCTION
Kenneth D. Mowbray, Des Plaines, Ill., assignor to Electro Sprayer Systems, Inc., Rosemont, Ill.
Filed Dec. 17, 1973, Ser. No. 425,334
Int. Cl. B05b *15/04*; **B05c** *11/10*
U.S. Cl. 118—312 **18 Claims**



1. In a system for applying powder to a moving surface wherein the powder is sprayed from an applicator, the improvement comprising means located adjacent the applicator for collecting excess powder from around the applicator to thereby reduce the presence of the powder in the surrounding atmosphere, said collecting means comprising a plurality of modules, each module comprising enclosing walls including end walls and interconnected side walls, inlet and outlet openings defined by each module, means supporting the modules in end-to-end assembly adjacent said applicator, the assembly of nozzles extending substantially across said moving surface, individual conduits connected to each of said outlet openings, and suction means connected to said conduits whereby powder in the air around the applicator is pulled simultaneously into the respective inlet openings and collected through said conduits.

3,882,819
DEVICE FOR COATING ELEMENTS OF CONTINUOUS LENGTH
William Ronald Skeeters, Shelbyville, Tenn., assignor to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Apr. 17, 1974, Ser. No. 461,747
Int. Cl. B05c *3/12*
U.S. Cl. 118—405 **9 Claims**

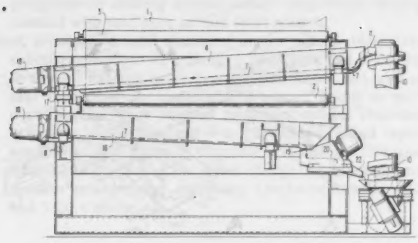


1. A device for applying a liquid coating composition to an element of continuous length comprising a body member including an intermediate wall having an aperture to allow passage of the element to be coated, a first axial bore in the body member in communication with and on one side of the aperture, a die member within said bore, an adjustable pressure member within said bore for engagement with the die member, a second axial bore in the body member in communication with the aperture and on the opposite side of the intermediate wall, an inlet opening in the body member to allow a coating composition to be fed to the second bore, and valve means within said second bore for regulating the flow of coating composition to the die member, the valve means comprising an annular wall extending axially from said intermediate wall into said second bore and surrounding said aperture, the free edge of the annular wall providing a valve element, and an adjustable valve member in the second bore cooperable with said valve element, the die member, adjustable pressure member and valve member having openings therethrough in alignment with said aperture.

3,882,820
COATING APPARATUS
Karl Höck; Alfred Nieroba, both of Troisdorf, and Karl Heinz Weiper, Schladern, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft
Filed Aug. 30, 1973, Ser. No. 393,195
Claims priority, application Germany, Aug. 31, 1972, 2242953
Int. Cl. B05c *11/10*
U.S. Cl. 118—603 **27 Claims**

1. Apparatus for the bilateral powdering of a film web comprising:
a conveying chute,
powder supplying means for supplying powder to said conveying chute,
conveying chute vibrator means for vibrating said conveying chute such that said powder travels along the length of the conveying chute in a conveying direction,
an elongated slot formed in the bottom of said conveying chute,
and film web conducting means for conducting a film web through said slot in an upward direction and upwardly

through said conveying chute such that said film web is contacted on both sides thereof by the powder in said



conveying chute as it passes through said conveying chute.

3,882,821

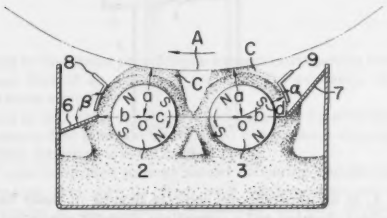
DEVELOPING DEVICE FOR ELECTROPHOTOGRAPHY

Hajime Katayama, Kawasaki, and Toru Takahashi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 276,312, July 31, 1972, abandoned, which is a continuation of Ser. No. 16,288, March 4, 1970, abandoned. This application Mar. 12, 1973, Ser. No. 340,299

Int. Cl. G03g *13/08*

U.S. Cl. 118—637 **4 Claims**



1. An electrophotographic developing device for forming a toner image on a photosensitive member comprising a developer chamber for storing electrophotographic developer including magnetic carrier and toner, at least one rotary magnetic roller positioned in said developer chamber, said magnetic roller having a plurality of N- and S-poles alternately arranged in the circumferential direction of said roller, magnetic brush shaping plate means disposed adjacent to the surface of the magnetic brush formed of said developer on said magnetic roller for shaping a hard magnetic brush layer to a predetermined thickness which will not contact with an image developing surface of a sensitized member, and magnetic field adjusting plate means made of a magnetic material for uniformly, strongly and continuously raising soft brushes upon said hard brush layer, and wherein the leading edge of said magnetic field adjusting plate means is spaced apart from the center of said magnetic roller by a distance longer than that between the center of said magnetic roller and the leading edge of said magnetic brush shaping plate means and said magnetic field adjusting plate means is diverged radially outwardly from said leading edge of said magnetic field adjusting plate means in the direction of rotation of said magnetic roller.

3,882,822

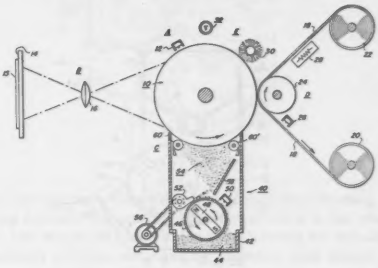
APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

William A. Sullivan, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 285,986, Sept. 5, 1972, Pat. No. 3,791,730, which is a division of Ser. No. 105,887, Jan. 12, 1971, Pat. No. 3,707,390. This application Jan. 11, 1974, Ser. No. 432,734

Int. Cl. G03g *15/08*

U.S. Cl. 118—637 **4 Claims**



1. An apparatus for developing electrostatic latent images previously formed on a support member comprising:

a reservoir for storing a supply of magnetic toner particles a chamber having one end positioned to receive said electrostatic latent image-bearing support member and an opposed end terminated in said reservoir;

a drum positioned partially within said reservoir in position to contact the magnetic toner particles therein;

means situated within said drum for producing a magnetic field poled to attract magnetic toner particles and rotating in a predetermined direction, whereby toner particles are carried in said direction from said reservoir circumferentially across the surface of said drum;

means for imposing a charge upon said magnetic particles of opposite polarity to the electrostatic latent image; and blower means within said chamber for directing a jet of gaseous material across the surface of said drum to dislodge the magnetic particles from the surface thereof, thereby forming a suspension of said magnetic particles in said gaseous material,

whereby development of said electrostatic latent image is effected upon contact of said magnetic toner particles in said suspension with said latent image.

3,882,823

STIRRING AND SCRAPING DEVICE FOR DEVELOPING MATERIAL

Susumu Tanaka, Sakai; Yuji Enoguchi, Osaka, and Hidetoshi Kawabata, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 9, 1974, Ser. No. 486,839

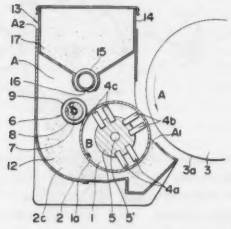
Claims priority, application Japan, Aug. 2, 1973, 48-91615

Int. Cl. G03g *13/08*

U.S. Cl. 118—637 **13 Claims**

1. In a developing device for use in an electrophotographic copying apparatus which comprises a developing roller rotatably provided adjacent to a photoreceptor having a photoreceptor surface on the outer periphery thereof, said developing roller including a rotatable outer cylinder, and a plurality of stationary magnets enclosed in said outer cylinder and disposed in such positions that magnetic fields of said magnets intersect to attract and feed developing material onto said outer cylinder so as to form magnetic brush bristles on said outer cylinder for developing an electrostatic latent image formed on said photoreceptor surface into a visible toner

powder image, a toner dispenser provided above said outer cylinder for replenishing said developing material with fresh toner powder, and a sump for said developing material provided below said developing roller, an improvement thereof for efficient stirring and mixing of said developer material with said fresh toner powder and scraping of said developer material off said outer cylinder after said developing comprises a stirring and scraping device composed of a rotary member provided below a toner dispenser and adjacent to an outer periphery of said outer cylinder, said rotary member which is provided with a plurality of grooves and square edges on an outer periphery thereof being adapted, during rotation



thereof, to contact said developing material on said outer cylinder and to be magnetized by the magnetic force of said stationary magnets, said developing material being attracted onto said rotary member by magnetic force of the latter concentrating on said square edges and by a difference of strength of magnetic force between said square edges and said grooves, and subsequently dislodged from said rotary member by centrifugal force and decreasing magnetic force due to rotation of said rotary member and by the own weight of said developing material, during which process said developing material is stirred and mixed with said fresh toner powder from said toner dispenser.

3,882,824

GROOMING AID FOR HAIRY ANIMALS

Gwendolyn Kay Acquaviva, 982 Ledge Rd., Medina, Ohio 44256

Filed Oct. 16, 1973, Ser. No. 405,561
Int. Cl. A01k *29/00*
U.S. Cl. 119—156 **5 Claims**

1. A method of grooming the coats covering the bodies of four-legged animals to provide a soil-resistant surface and improve the appearance of the coat which comprises:

a. cleaning the hair of the coat of the animal,

b. applying a polish consisting essentially of water and from about 1 to about 40% by weight of an alkyl polysiloxane to the coat of the animal, and

c. allowing the coat to dry to develop the desired soil-resistant polished finish on the coat of the animal.

3,882,825

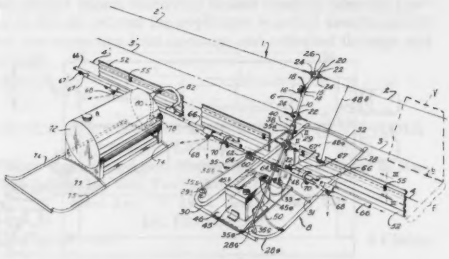
METHOD AND APPARATUS TO METER FORAGE

Vergil McFadden, Rt. 3, Paris, Tex. 75460

Filed June 6, 1973, Ser. No. 367,652
Int. Cl. A01k *3/00*
U.S. Cl. 119—20 **6 Claims**

1. A method of feeding animals comprising:

positioning a fence having a plurality of strands of wire strung between inclined posts across the ground such that animals are restrained from walking in a feeding area bounded on one side by a vertical plane in which the upper most strand of wire is disposed; positioning the fence such that upper ends of the posts are inclined toward the feeding area; spraying liquid nutrient on the feeding area; moving the fence to establish a new feeding



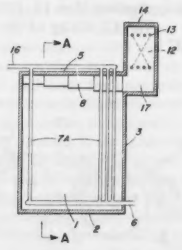
area; and delivering electricity to each of said strands of wire.

3,882,826

FLUE GAS DISTRIBUTOR AND RADIATOR FOR UNIFORM HEAT TRANSFER

George F. Feldner, Westwood, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 472,328, May 22, 1974, abandoned. This application Aug. 21, 1974, Ser. No. 499,113
Int. Cl. F22b *21/00*
U.S. Cl. 122—333 **15 Claims**



1. In an apparatus for indirect heating of fluids having a radiant chamber and a convection chamber connected to the upper portion of the radiant chamber and laterally offset therefrom, the radiant chamber containing at least one row of tubes for passing a fluid to be heated therethrough, and means for providing radiant heat to the tubes and the fluid passing therethrough, the improvement comprising a plurality of horizontally disposed elongated ducts, located in the upper portion of the radiant chamber, disposed parallel to the row of tubes and extending substantially across the radiant chamber, means for admitting combustion gases from the radiant heating means into the ducts, and means for transmitting combustion gases from the ducts to the convection chamber.

3,882,827

FOUR-PHASE CYCLE PLANETATING PISTON INTERNAL COMBUSTION ENGINE

Robert H. Williams, Rt. 2, Bandera, Tex. 78003

Filed Mar. 12, 1974, Ser. No. 450,290
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.27 **6 Claims**

1. In a four-phase cycle planetating piston internal combustion engine, the combination of:

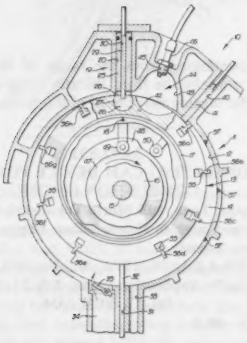
a stator having a cylindrical bore closed by end walls providing a pair of bearings co-axial with said bore;

a shaft journalling in said bearings;

an eccentric fixed on said shaft;

a cylindrical annular piston within which said eccentric journals, said piston being co-extensive axially with said bore and of such an outside diameter as to remain in a progressively shifting approximately tangentially sealing contact with said bore as said shaft rotates;

first, second and third abutment means radially biased respectively at about 12 o'clock, 1:20 o'clock and 6 o'clock to seal off the free space between said piston and bore at said respective circumferentially spaced points to produce a fuel vapor suction and compression chamber extending clockwise from 6 to 12 o'clock, a fuel vapor expansion and exhaust chamber extending clockwise from 12 to 6 o'clock, and a fuel charge confinement and ignition sub-chamber extending clockwise between 12 and 1:20 o'clock;



means in said stator providing an exhaust port opening from said bore at an advanced point in said expansion and exhaust chamber;

means in said stator providing a fuel inlet port for admitting gaseous fuel into said suction and compression chamber when the latter is in its suction phase;

first cam controlled passage means delivering compressed gaseous fuel directly from said suction-compression chamber to said ignition sub-chamber, and then shutting said passage means;

second cam controlled means for opening said second abutment means in timely relation with and following the shutting of said passage means;

a timely actuated ignition means for igniting a fuel charge confined by said ignition sub-chamber at the beginning of a power stroke; and

tethering means connected peripherally to said piston to limit the rotation of said piston relative to said stator to a planetating movement in said bore.

3,882,828

FUEL INJECTION TYPE ROTARY PISTON ENGINE

Yoshinori Honiden, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

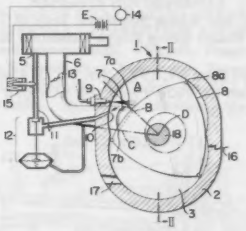
Filed Sept. 27, 1973, Ser. No. 401,255

Claims priority, application Japan, Sept. 27, 1972, 47-112000

Int. Cl. F02b *53/10*

U.S. Cl. 123—8.09 **10 Claims**

1. A rotary piston type internal combustion engine comprising a casing including a rotor housing having a trochoidal inner peripheral wall surface and a pair of side housings airtightly secured to the opposite sides of said rotor housing, a polygonal rotor having apices sealingly contacting the inner peripheral surface of said rotor housing so as to provide working chambers between said rotor and said rotor housing, means for rotating said rotor so as to effect volumetric changes of each working chamber through intake, compression, combustion and exhaust strokes, intake port means provided in at least one of said side housings for introducing fresh air into the working chamber which is in the intake



stroke, fuel injection means provided in said rotor housing for injecting fuel into the working chamber which is in the intake stroke, and means provided in the rotor housing for introducing auxiliary air into said working chamber, said means for introducing auxiliary air being spaced apart from said fuel injection means on said rotor housing and being positioned so that the auxiliary air flow intersects the injected fuel stream within said working chamber.

3,882,829

FUEL INJECTION CONTROL DEVICE

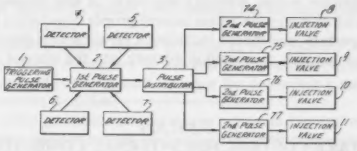
Takeo Sasaki, 840 Chiyoda-cho, Himeji, Hyogo, Japan

Continuation-in-part of Ser. No. 78,111, Oct. 5, 1970. This application Sept. 13, 1972, Ser. No. 288,760

Claims priority, application Japan, Oct. 8, 1969, 44-80572

Int. Cl. F02d *5/04*

U.S. Cl. 123—32 EA **5 Claims**



1. A fuel injection control device for use in internal combustion engines comprising a plurality of valve means each having at least one fuel injection valve connected to an internal combustion engine, triggering pulse generator means for generating triggering pulses in response to a predetermined rotational angle of the engine, first pulse generator means for generating a train of first pulse signals wherein each said first pulse signal is produced in response to each of said triggering pulses, dividing means connected to said first pulse generator means and having a plurality of outputs for dividing pulses of said first pulse signals successively between said plurality of outputs, a plurality of second pulse generators each having an input connected to a respective one of said dividing means outputs for generating respective second pulse signals responsive to the divided train of first pulse signals, means for controlling in common the pulse widths of said second pulse signals, and a plurality of combining means each connected to a respective one of said dividing means outputs and a respective one of said second pulse generators for producing a sum signal of said first and second pulse signals, each said combining means having an output connected to a respective one of said valve means for controlling the actuating period of each of said valve means, whereby each of said valve means is capable of actuating independently of the other of said valve

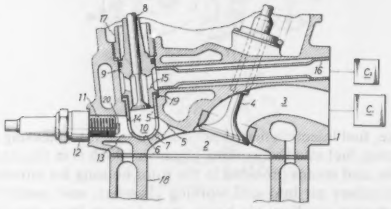
means, continuously for periods greater than 720° of engine rotation and the injection period of one of the valve means is capable of overlapping that of another said valve means independently of said another said valve means.

3,882,830

COMBUSTION CHAMBER DEVICE FOR INTERNAL COMBUSTION ENGINES

Tadashi Kume, and Kimio Shinmura, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 29, 1973, Ser. No. 374,868
Int. Cl. F02b *19/00, 19/10, 19/18*
U.S. Cl. 123—75 B **5 Claims**



1. In an internal combustion engine having a main combustion chamber, the combination of: walls forming a cavity, a cup having a cylindrical side wall closed at one end by a bottom wall, the cup being insertable into the cavity along the axis of the cylindrical wall, to define an auxiliary combustion chamber within the cup, means forming a restricted torch nozzle passage connecting the auxiliary chamber and the main chamber, said passage including a first aperture positioned in said cup at one side of the said axis, said cavity walls forming an ignition recess adjacent said cup, a spark plug having electrodes positioned in said recess spaced from and outside said cup, said cup having a second aperture communicating with said ignition recess, whereby alignment of said second aperture with said ignition recess insures proper orientation of said first aperture, and means including a valved intake passage for supplying a rich combustible mixture into the interior of said cup.

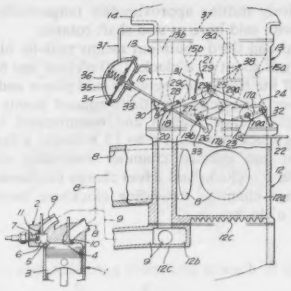
3,882,831

INTAKE CONTROL FOR INTERNAL COMBUSTION ENGINES

Tasuku Date, Tokyo; Shizuo Yagi, and Kiyoshi Miyaki, both of Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1974, Ser. No. 451,584
Claims priority, application Japan, Mar. 19, 1973, 48-30862
Int. Cl. F02b *75/02*
U.S. Cl. 123—75 B **3 Claims**

1. An intake control device for internal combustion engines of the type including a main combustion chamber and an auxiliary combustion chamber, the latter having a spark plug, the chambers being joined by a torch passage and being connected respectively to an inlet valve controlled main intake passage and auxiliary intake passage, said intake control device comprising: a main carburetor including a main primary passageway having a first throttle valve and a main secondary passageway having a second throttle valve, said primary and secondary passageways adapted to produce a lean air-fuel mixture and connected in common to said main intake passage, an auxiliary carburetor including an auxiliary passageway having a third throttle valve, said auxiliary passageway adapted to produce a rich air-fuel mixture and connected to said auxiliary intake passage; and interconnecting means operable under light engine load conditions to coordinatively open the first and third throttle valves, and operable to open said second throttle valve under a range of heavy engine load



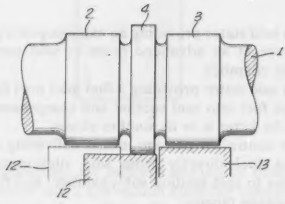
conditions continuing from the range of light engine load conditions, whereby the third throttle valve opens coordinatively with the turning movement of the second throttle valve.

3,882,832

VALVE OPERATING CAM DEVICE FOR INTERNAL COMBUSTION ENGINE

Kiyoshi Ohsaki, Toda, and Morio Takahashi, Toyohashi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 16, 1974, Ser. No. 488,917
Claims priority, application Japan, July 31, 1973, 48-89872
Int. Cl. F01l *1/04*
U.S. Cl. 123—90.6 **2 Claims**



1. For use with an internal combustion piston engine having a main combustion chamber provided with a main intake valve and an exhaust valve, and having an auxiliary combustion chamber provided with an auxiliary intake valve, the improvement comprising: a rotary camshaft having three axially spaced cam lobes integrally formed thereon for actuating said three valves, respectively, one cam lobe being positioned between the other two cam lobes and having greater radial dimensions than one of the other cam lobes at every angular position of the shaft.

3,882,833

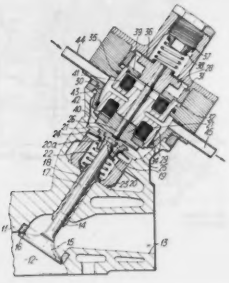
INTERNAL COMBUSTION ENGINES

Kenneth Longstaff, Alcester, and Stanley Holmes, Flyford Flavel, both of England, assignors to British Leyland (Austin-Morris) Limited, Longbridge, Birmingham, England

Filed July 12, 1973, Ser. No. 378,668
Claims priority, application United Kingdom, July 12, 1972, 32480/72
Int. Cl. F01l *9/04*
U.S. Cl. 123—90.11 **5 Claims**

1. An internal combustion engine having:

a. a block including at least one cylinder;
b. the block defining a duct providing access to the cylinder;
c. a tappet valve having a stem and a valve head, the stem being disposed in, and slidable relative to, the block for movement between a closed position in which the valve head isolates the duct from the cylinder and an open position in which the valve head allows the passage of fluid between the duct and cylinder;
d. magnetic means linked to the valve stem;
e. a magnetic field generator mounted on the block and adapted to generate a magnetic field to retain the valve,



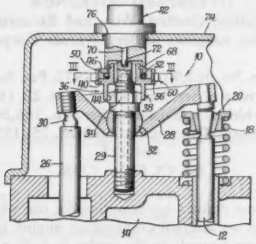
by way of the magnetic means, in the open or the closed position; and
f. resilient means disposed on the block, and adapted to act between valve and block to bias the valve against the action of the magnetic field of the generator, said resilient means comprising first and second belleville spring washers so disposed between valve and block that, in the open position, the first belleville spring washer is fully compressed while the second belleville spring washer is uncompressed, and, in the closed position, the second belleville spring washer is fully compressed while the first belleville washer is uncompressed.

3,882,834

VALVE LASH ADJUSTER

Alexander Goloff, East Peoria, and Mark F. Sommars, Peoria, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Jan. 28, 1974, Ser. No. 437,384
Int. Cl. F01l *1/20*
U.S. Cl. 123—90.43 **8 Claims**



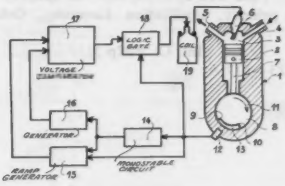
1. In a system having a rocker arm pivotable about a pivot member to actuate a valve, and adjusting means associated with said rocker arm and pivot member and movable in first and second directions to respectively decrease and increase lash between the valve and rocker arm, an adjustment member, and means interconnecting the adjustment member and adjusting means for providing that (i) the adjustment member is movable in one direction to move the adjusting means in said first direction to decrease said lash to a level of substantially zero, with further movement of said adjustment member in said one direction providing no further movement of said adjusting means in said first direction, and (ii) movable in another direction to move the adjusting means in said second direction to increase said lash.

3,882,835

ELECTRIC PULSE GENERATING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Williams Randriamanentena, Villejuif, France, assignor to Compteurs Schlumberger, Montrouge, France

Filed Mar. 16, 1973, Ser. No. 342,117
Claims priority, application France, Mar. 24, 1972, 72.10355
Int. Cl. F02g *5/08*
U.S. Cl. 123—117 R **2 Claims**



1. In combination with the ignition system of an internal combustion engine of the type having at least one piston moving in a cylinder and going through a position defining a "top dead center," said piston imparting a rotation to a crankshaft, an apparatus for generating electric pulses said apparatus including:

piston position detector means for delivering a first, variable duration voltage pulse during the interval when the piston moves between two predetermined positions, the duration of the voltage pulse being representative of engine speed, the end of said pulse substantially coinciding with the instant the piston goes through the top dead center in the cylinder;

monostable circuit means coupled to said detector means and being responsive to the end of the variable duration pulse delivered by said detector for delivering a pulse of constant duration;

first ramp generator circuit means connected to said monostable circuit means and being responsive to each said pulse of constant duration for delivering a second voltage pulse whose leading edge has a slope substantially proportional to the speed of rotation of said crankshaft driven by said piston, and whose trailing edge has a steep slope, said second voltage pulse being delivered during the interval of time when said detector delivers said first voltage pulse;

second generator circuit means connected to the output of said monostable circuit means and responsive to said pulse of constant duration for producing a voltage having a level substantially inversely proportional to the speed of rotation of the crankshaft;

voltage comparator circuit means connected to said first and second generator circuit means for comparing the values of the voltages delivered by said first and second generator circuit means,

said comparator delivering a pulse when the voltage produced by said second generator means is lower than a value obtained by the voltage of the leading edge of the pulse delivered by said first generator means,

the beginning of the pulse delivered by said comparator circuit means being coincident with equality between the value of the voltage of the leading edge of the pulse delivered by said first generator means and the value of the pulse delivered by said second generator means, the

pulse delivered by said comparator constituting an energy controlling signal to control said engine ignition system; and

means connected to said second generator circuit means and to said comparator circuit means for producing and for applying to the input of said comparator circuit means, for at least one predetermined value of the speed of rotation of said crankshaft, an auxiliary reference voltage of predetermined value replacing the voltage delivered by said second generator.

3,882,836

SPARK ADVANCE MECHANISM FOR IGNITION DISTRIBUTORS OF INTERNAL COMBUSTION ENGINES

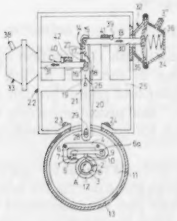
Joseph Heine, Leonberg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 3, 1973, Ser. No. 403,171

Claims priority, application Germany, Oct. 6, 1972, 2249128

Int. Cl. F02p *5/10*

U.S. Cl. 123—117 A **19 Claims**



1. In an ignition distributor for internal combustion engines, a combination comprising a rotary driving shaft; at least one signal generating device adjacent to said driving shaft; an actuating device receiving torque from said driving shaft and arranged to actuate said signal generating device at least once during each revolution of said driving shaft; a carrier for said signal generating device, said carrier being movable angularly from a neutral position about said driving shaft to thereby change the timing of actuation of said signal generating device; and regulating means for changing the angular position of said carrier, including a displacing member pivotable about a fixed pivot axis and having a first portion operatively connected with said carrier and a second portion, a motion transmitting member mounted on said second portion pivotable about a second pivot axia and having first and second arms, and first and second adjusting members respectively connected at first and second points to the first and second arms and operable to pivot said displacing member through the medium of said motion transmitting member, whereby said displacing member changes the angular position of said carrier, a first line which is normal to and intersects said fixed pivot axis and said second pivot axis and a second line connecting said first and said second points extent when said carrier is in said neutral position, substantially in the same direction and in radial direction of said driving shaft, and the direction of the forces produced by said adjusting members on said first and second points being substantially normal to both of said lines.

3,882,837

EXHAUST GAS RECIRCULATION CONTROL DEVICE FOR INTERNAL COMBUSTION

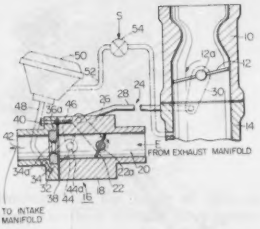
Masakazu Horie, Tokyo; Takao Fukuhara, and Tetuya Harada, both of Yokohama City, all of Japan, assignors to Nissan Motor Company Limited, Yokohama City, Japan

Filed Mar. 1, 1973, Ser. No. 337,198

Claims priority, application Japan, Mar. 2, 1972, 47-21728

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 A **3 Claims**



1. In an exhaust gas recirculation system of an internal combustion engine having a carburetor throttle valve and an intake manifold, a flow control device for controlling the amount of exhaust recirculation to said intake manifold, said device comprising, in combination, passage means for recirculating engine exhaust gases to said intake manifold, valve means disposed in said passage means and responsive to the opening degree of said throttle valve for varying the effective cross sectional area of said passage means, and flow restricting means located in said passage means in series with, and downstream of said valve means, said flow restricting means including a butterfly valve downstream of said valve means, a diaphragm type actuator responsive to intake manifold vacuum, a butterfly valve arm linked to said actuator, a passageway connecting said intake manifold to said actuator, a solenoid valve located in said passageway in response to a signal indicative of said engine operating under light load and cold condition causing said actuator to close said butterfly valve through movement of said throttle valve arm linked to said actuator.

3,882,838

CHARGE FORMING METHOD AND APPARATUS WITH OVERSPEED GOVERNOR

Warren D. Nutten, Grafton, Wis., and Bernard C. Phillips, Toledo, Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.

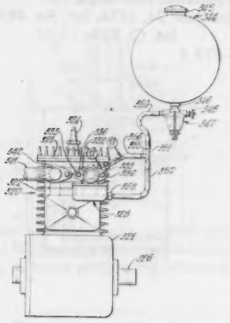
Division of Ser. No. 302,902, Nov. 1, 1972, Pat. No. 3,822,685, which is a division of Ser. No. 74,812, Sept. 23, 1970, Pat. No. 3,738,608, which is a division of Ser. No. 766,580, Oct. 10, 1968, abandoned. This application Mar. 25, 1974, Ser. No. 454,211

Int. Cl. F02m *13/06*

U.S. Cl. 123—127 **18 Claims**

1. A fuel flow control construction for use with the induction system of an internal combustion engine for delivering excess fuel from a supply to the engine including, in combination, means providing a chamber, a relatively movable valve member in said chamber being solely responsive to engine structural vibration transmitted through the engine frame, said valve member having a spherically curved surface region, a valve seat surface disposed to be engaged by the spherically curved surface region of the valve member, said valve seat surface being configurated to define a fuel port, spring means providing the sole force normally biasing the valve member to port-closing position, fuel passage means in communication

with said chamber, said valve member being of a mass to be vibrated away from the valve seat surface under the influence



of engine structural vibration of a predetermined frequency to effect flow of fuel from the supply through said port.

3,882,839

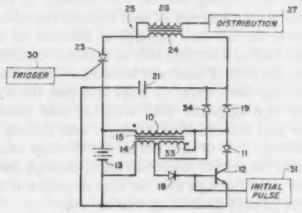
CAPACITIVE DISCHARGE IGNITION SYSTEM UTILIZING A FEEDBACK CONTROLLED OSCILLATOR

David P. Ganoung, 3410 Smith Southeast, Apt. C., Albuquerque, N. Mex. 87106

Filed Aug. 27, 1973, Ser. No. 391,630

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 R **9 Claims**



1. A capacitor-discharge ignition circuit comprising:

a capacitor,

an inductor,

an ignition coil having a primary winding

a source of direct current potential, and

a unidirectional current passing device,

said primary winding and said source of direct current potential each being switchably connected in parallel across a winding of said inductor, and said capacitor being switchably connected in parallel across said primary winding,

said unidirectional current passing device and said capacitor being connected in series, the series being connected in parallel with said winding of said inductor, and being oriented to receive and store a current maintaining voltage generated in said winding of said inductor.

3,882,840

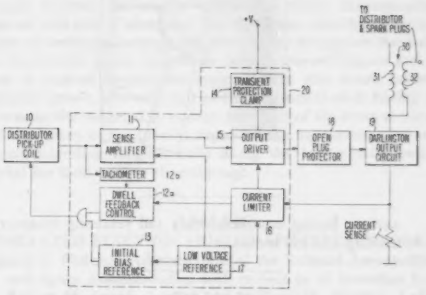
AUTOMOTIVE IGNITION CONTROL

Andrew A. Adamian, Sunnyvale; David K. Long, and Donald E. Pezzolo, both of Mountain View, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Continuation of Ser. No. 241,752, April 6, 1972, abandoned. This application Nov. 26, 1973, Ser. No. 419,172

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 E **12 Claims**



1. An ignition control system for use in an internal combustion engine having at least one means for igniting fuel, said system comprising:

a. means for producing a control signal alternating in timed relationship with an engine;

b. an energy storing ignition coil possessing a primary and a secondary side, said secondary side being cyclically coupled to said means for igniting in timed relationship with said engine;

c. a power output circuit coupled to the primary side of said coil for drawing current through said coil;

d. means coupled to said power output circuit and responsive to said control signal for switching said power output circuit off to discharge said coil through said means for igniting;

e. means for limiting the maximum current drawn by said power output circuit through said ignition coil;

f. means for dissipating energy stored in said coil when said energy fails to discharge through said means for igniting, said means for dissipating comprising at least one diode connected from a reference potential to the primary side of said coil, siad diode coupled so as to conduct current when said primary side is at a selected lower potential than said reference potential; and

g. means for turning or maintaining OFF said power output circuit when said means for producing a control signal is either open-circuited or short-circuited.

3,882,841

GLOW PLATE FOR INTERNAL COMBUSTION ENGINE

Abraham Silverstein, 1810 Metzeroth Rd., Adelphi, Md. 20783

Filed Sept. 19, 1973, Ser. No. 398,775

Int. Cl. F02f *3/02, 3/12*

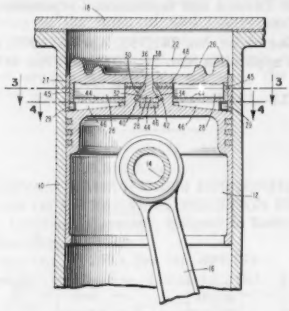
U.S. Cl. 123—193 CP **10 Claims**

1. A device for increasing the efficiency of an internal combustion engine having a cylinder and a moveable member therein comprising:

a. a thermally conductive plate carried by the moveable member said plate and member having surfaces facing each other;

b. means between the plate and member to hold the plate in spaced apart relation from the member while permitting thermal expansion of the plate comprising a plurality

of discrete rail means projecting from one of said surfaces along lines of thermal expansion of the plate, the other



surface having complementary rail retaining means receiving said rail means.

3,882,842

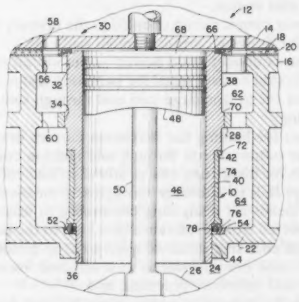
CYLINDER LINER SUPPORT

John M. Bailey, Dunlap; Michael K. Stratton, Peoria, and Alan W. Wells, Edelstein, all of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Jan. 28, 1974, Ser. No. 437,204

Int. Cl. F01j *11/04;* **F02f** *1/02*

U.S. Cl. 123—193 C **6 Claims**



1. In an internal combustion engine, a cylinder head mounted on a cylinder block, said block defining a top deck portion, a cylinder bore in said cylinder block, a generally cylindrical cylinder liner disposed within said cylinder bore, a reduced diameter portion of said cylinder liner defining an annular shoulder intermediate said top deck and said shelf, means for supporting said cylinder liner comprising a support sleeve circumscribing said reduced diameter portion of said cylinder liner having an end thereof in abutment with said annular shoulder, wherein said support sleeve is relatively thin walled with respect to said cylinder liner whereby it possesses a relatively lower spring rate with respect to said sleeve, and further including means for preventing radial movement of said cylinder liner in said block comprising a shelf in said block intermediate said top deck and lower wall defining a bore, and an annular flange on said cylinder liner closely fitted within said last-named bore.

3,882,843

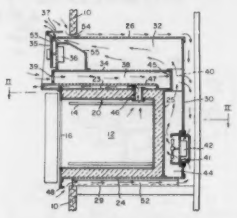
SELF-CLEANING WALL OVEN WITH AIR FLOW SYSTEM

Eugene J. Barnett, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1974, Ser. No. 482,196

Int. Cl. F24c *15/32*

U.S. Cl. 126—273 A **4 Claims**



1. An oven assembly of the pyrolytic self-cleaning type for wall installation in a cabinet having an opening sufficiently large that a perimetric air inlet is defined between the boundaries of said opening and at least the top and opposite sides of the oven assembly, comprising:

outer housing means including top, bottom, rear and opposite side walls;

a thermally-insulated oven liner having an open front disposed in said housing and presenting top, bottom, rear and opposite side outer faces, the rear and opposite side outer faces being spaced inwardly from the respectively facing walls of said outer housing to define air flow passages therebetween;

a control chamber in the top part of said outer housing and having a top front air outlet, the bottom of said control chamber defining an intermediate passage with the top outer face of said oven liner, said intermediate passage having an air inlet opening at its front and an air outlet opening to the space behind said housing rear wall at its rear;

duct means connecting said air flow passage at the rear of said liner to the interior of said control chamber; and

fan means in the air flow passage at the rear of said oven liner and having a suction side in communication with the space to the rear of said rear housing wall for drawing air through said perimetric air inlet and past the exterior of said top and opposite side walls of said housing, and through said intermediate passage, and forcing air from the discharge side of said fan means through said air flow passage at the rear of said oven liner, through said control chamber, and through said air flow passages at the opposite sides of said liner from rear to front.

3,882,844

SUBMERGED HOT GAS HEAT EXCHANGER

Akira Ohara, 591-4 Niina, Minoo City, Osaka, and Masa Takahashi, 3-41-8 Taito, Taito-ku, Tokyo, both of Japan

Claims priority, application Japan, June 28, 1972, 47/76990

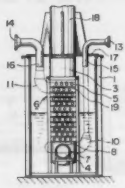
Filed June 22, 1973, Ser. No. 372,584

Int. Cl. F24h *1/20*

U.S. Cl. 126—360 A **1 Claim**

1. A submerged hot gas heat exchanger, comprising, a tank containing a heat exchanging liquid, a burner mounted at the upper end of said tank, a combustion gas shroud connected with said burner and extending into the lower portion of said tank, a combustion gas sparge pipe connected with said shroud at its lower end, said sparge pipe having a plurality of apertures along its upper surface for jetting air and combustion gases into the liquid, a tube located within said tank above said sparge pipe, said tube being bent into a plurality of parallel tube sections for the passing of a process liquid therethrough, upper and lower vertical fins attached to said tube

sections, inlet and outlet header tanks connected to opposite ends of said tube, said tanks along with a part of said tubes forming a heat exchanging portion and means for preventing film boiling being provided in the said heat exchanging portion, wherein said means includes a small diameter tube located within said inlet header tank, said tube having a plurality of orifices along its lower surface for delivering a liquid to be treated.

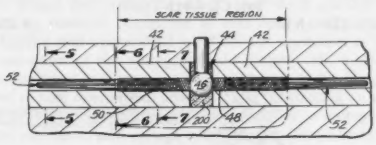


3,882,845

METHODS AND DEVICES FOR REDUCING LUMEN CONSTRICTION

Louis Bucalo, Holbrook, N.Y., assignor to Investors In Ventures, Inc., New York, N.Y.

Filed Dec. 17, 1973, Ser. No. 424,927
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 R **24 Claims**



1. In a surgical method to be performed at the region of a tubular body organ, the steps of performing surgical procedures at the region of the tubular body organ for obtaining access to the interior thereof, so that subsequent to the surgical procedure scar tissue will form at the latter region during healing of tissue at said region, and introducing into the tubular body organ after access is obtained thereto by the surgical procedures a tubular implant which is longer than said region, the implant having an intermediate portion for opposing constriction by scar tissue which forms at said region and for performing a specific function for which the implant is designed and a pair of opposed elongated flexible portions extending in opposite directions beyond the intermediate portion and while being substantially less rigid than said intermediate portion and bendable with respect thereto also having sufficient rigidity to support the wall of the tubular organ in the interior thereof for opposing constriction and preventing kinking of the tubular organ in opposite directions beyond the intermediate portion of the implant while providing beyond the intermediate portion of the implant in the lumen of the tubular organ a clearance sufficient to permit fluid to flow through the tubular organ, and introducing the implant into the tubular organ with the intermediate portion thereof situated at the region where scar tissue forms while locating said elongated flexible portions at regions extending along the interior of the tubular organ in opposite directions beyond opposed ends of the intermediate portion situated at said region where scar tissue forms.

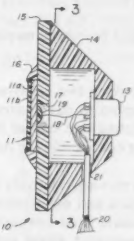
7. An implant to be introduced into a tubular organ after surgical procedures are performed to give access to the interior of the tubular organ at a region along the tubular organ where scar tissue will form during healing subsequent to the introduction of the implant into the tubular organ, said implant having a length which is greater than the length required to occupy the interior of the tubular organ at the region thereof where the scar tissue subsequently grows and said implant including elongated tubular means for permitting a body fluid to flow along the interior of the tubular organ through the implant, said tubular means having a rigidity sufficiently great to support the tubular organ and oppose substantial constriction thereof by the scar tissues the implant further including a pair of elongated flexible means of substantially greater flexibility than said tubular means connected with and extending in opposite directions beyond opposed ends of said tubular means for extending therefrom respectively beyond said opposed ends into regions of the tubular organ beyond the region where scar tissue subsequently grows, said pair of elongated flexible means while being bendable nevertheless having sufficient rigidity to support the wall of the tubular organ and permit curving thereof without kinking at regions beyond the region where scar tissue subsequently grows, and said pair of flexible means each having a cross section adapted to occupy only part of the cross section of the lumen of the tubular organ for leaving therein a clearance extending longitudinally along the lumen sufficiently great for fluid to flow therethrough.

3,882,846

INSULATED ELECTROCARDIOGRAPHIC ELECTRODES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention by; Robert M. David, Austin, and William M. Portnoy, Lubbock, both of Tex.

Filed Apr. 4, 1973, Ser. No. 347,953
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 E **5 Claims**



1. An electrode for detecting bioelectric potentials comprising:

a. housing means made of substantially non-electrically conductive material and having a flat outer surface portion;

b. an electrically conductive substrate having a front face and a back face mounted in a fixed relationship to said outer surface portion of said housing means such that said substrate and said outer surface portion of said housing means are essentially parallel;

c. a substantially non-electrically conductive dielectric material mechanically bonded to and completely covering said front face of said substrate by means of radio-frequency sputtering techniques and wherein said resulting substrate is mounted on said outer surface portion of said housing means such that said dielectric material will be in intimate contact with an external body when said electrode is placed thereon and said back face of said substrate is exposed to the internal environment of said housing means;

d. electrically insulative encasing material extending continuously along and completely covering the edges of said substrate for preventing electrical current flow between said substrate and the external body;

e. an impedance transforming means mounted within said housing means and electrically connected to said back

face of said substrate for providing said electrode with a relatively low output impedance and a relatively high input impedance whereby the impedance of said electrode may be matched with and connected directly to conventional monitoring equipment having a relatively low input impedance; and,

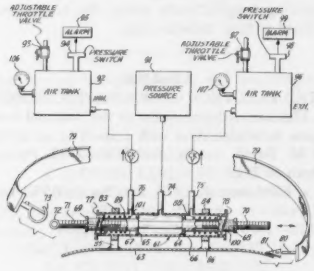
f. means for connecting said transforming means to the monitoring equipment.

3,882,847

LOW-COST PNEUMATIC APNEA OR RESPIRATION MONITOR

Harvey Barry Jacobs, 11607 Foxclove Rd., Hunters Woods, Reston, Va. 20091

Filed Dec. 11, 1973, Ser. No. 423,762
Int. Cl. A61b *5/10*; **A61m** *16/00*
U.S. Cl. 128—2 S **9 Claims**



1. A pressure fluid breathing monitor for a patient comprising:

a support,

a valve means having two relatively movable valve parts;

a body belt adapted to partly surround the patient's chest; means connecting one end of the belt to one valve part and means for connecting the other end of the belt to said support;

said valve parts moving relatively to each other in response to the inhalation and exhalation motions of the chest;

a source of pressure fluid connected to the valve means;

pressure fluid operated alarm means including two alarm devices, each connected to said valve means by a separate conduit means, one alarm responding to abnormal inhalation motion and the other to abnormal exhalation motion; conduit means connecting said alarm means to said valve means to receive pressure fluid therefrom for operation of said alarm device;

delay means connected to said conduit means to control the time interval wherein the pressure fluid effects the activation of the alarm means; and,

said relatively movable valve parts controlling the flow from said pressure fluid source to said conduit means in response to the inhalation and exhalation motions of the chest.

3,882,848

TEST PROBE FOR AN IMPEDANCE AUDIOMETER

Irwin Klar, New City, and Erwin H. Rock, Ardsley, both of N.Y., assignors to American Electromedics Corporation, Dobbs Ferry, N.Y.

Filed Jan. 24, 1974, Ser. No. 436,105
Int. Cl. A61b *10/00*
U.S. Cl. 122—2 Z **7 Claims**

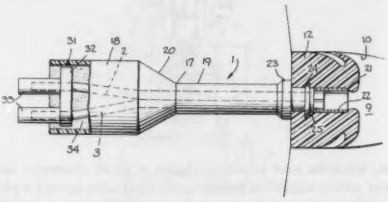
1. An improved ear test probe for use in evaluating hearing losses comprising the combination of:

a hollow casing including an open inner end portion for insertion into a patient's outer ear canal,

means at the casing inner end to seal the casing and said outer ear canal,

a plurality of hollow tubes extending through said casing from an outer end,

potting material within said casing and surrounding said tubes, and



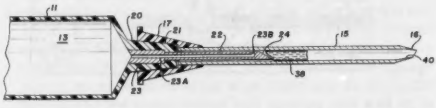
said hollow tubes having inner ends spaced inwardly from the inner end of said casing whereby a substantial cavity is provided at the inner end of said probe between said tube ends and said casing inner end.

3,882,849

SOFT TISSUE BIOPSY DEVICE

Khosrow Jamshidi, 610 Winston Ct., St. Paul, Minn. 55118

Filed Mar. 25, 1974, Ser. No. 454,064
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 B **9 Claims**



1. Biopsy aspirating means for gathering soft tissue samples comprising:

a. syringe means having a barrel, a reciprocable plunger sealingly received within such barrel and forming a controllably variable volume chamber with the interior of said barrel, a sample-receiving hollow needle having a sharpened tip, and needle mounting boss means at the base of said barrel and extending from said barrel and having a means receiving the hub of said sample-receiving needle thereon;

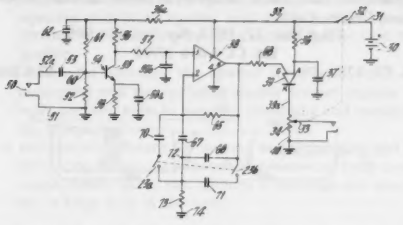
b. a gripping shaft coupled to said plunger and extending outwardly from said barrel, guide plate means disposed at the proximate end of said barrel and having an opening formed therein to receive said gripping shaft, said gripping shaft having locking lug means formed thereon and arranged to releasably engage the outer surface of said guide plate means for retaining said plunger in a position removed from said barrel tip means;

c. said needle mounting boss means having a central bore formed therein, a rigid needle mounting shaft disposed within said bore, said needle mounting shaft having an angularly disposed biopsy sample abutment surface at the forward end thereof, a bore formed within said needle mounting shaft and providing communication between said barrel and said hollow needle shaft at an orifice at the end of said needle mounting shaft bore, said orifice being disposed at a point spaced a finite distance from said angularly disposed sample abutment surface, said angularly disposed abutment surface being received within the bore of said hollow needle and being disposed along said needle shaft at a point removed from the tip end of said needle.

3,882,850
BRAIN WAVE FEEDBACK INSTRUMENT

Howard Bailin, 725 E. 84th St., Brooklyn, N.Y. 11236, and John Labenski, Stewartstown, Pa. 17363

Filed May 9, 1973, Ser. No. 358,723
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.1 B **8 Claims**

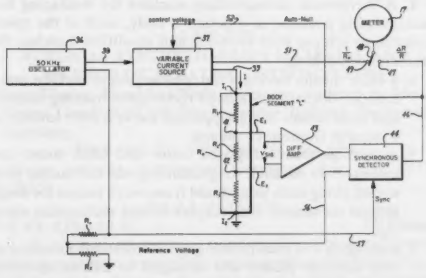


1. A brain wave bio-feedback instrument comprising an adjustable headband, an electrode supported by said headband, a second electrode, means for clipping the second electrode on a subject's ear and including a spring-operated clip, a control device, a first switch mounted on said control device, a single battery cell positioned within said control device and connected to said first switch and to a ground, an operational amplifier having an input and an output, means connecting one of said electrodes in series with said operational amplifier input, means connecting the other electrode to ground, a set of biasing resistors connected to said operational amplifier and biasing said operational amplifier for operation at about the mid-point of the voltage of said battery cell, a resistor-capacitor band-pass means connected between the input and output of said operational amplifier and comprising an active filter network with said operational amplifier, a voltage controlled oscillator, said voltage controlled oscillator being connected to the output of said operational amplifier so that the oscillator's frequency is thereby modulated by the output voltage of said operational amplifier, a sound transducer connected to said voltage controlled oscillator, and a second switch mounted on said control device to provide selection between Alpha and non-Alpha waves and connected to said band-pass means to selectively alter the operating elements of said band-pass means.

3,882,851
IMPEDANCE PLETHYSMOGRAPH

Frederick J. Sigworth, Orinda, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Continuation of Ser. No. 190,900, Oct. 20, 1971, abandoned. This application Aug. 15, 1973, Ser. No. 388,541
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.1 Z **5 Claims**

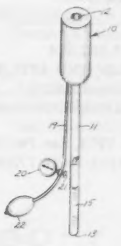


3. In a plethysmograph first and second current input electrodes, first and second voltage drop measuring electrodes adapted to be applied in pairs across a biological segment with one current electrode adjacent one voltage electrode and the other current electrode being adjacent the other voltage electrode, an oscillator having a high frequency output, a variable current source connected to the oscillator and to the first and second current input electrodes for receiving a timing signal from the oscillator so that an output oscillatory current is provided to the current input electrodes, amplifier means coupled to said first and second voltage drop electrodes for receiving the voltage developed across said voltage drop electrodes and producing an output responsive thereto, means for providing a predetermined reference voltage, means coupled to the amplifier means for detecting the output of the amplifier means and providing an output responsive thereto, said means for detecting receiving said predetermined reference voltage, means for supplying the output of the means for detecting to the variable current source to provide a control voltage for the variable current source so that the output from the variable current source provides an output from the amplifier means matching said predetermined reference voltage, wherein said current source includes a logarithmic function generator electrically coupled between the control voltage input and the oscillatory current output so that the plethysmograph will have a constant response time regardless of the biological segment resistance and the current level supplied to the biological segment, the output of the means for detecting providing a percent deviation signal which represents a percent of change of resistance value of the biological segment, and indicating means for receiving the percent deviation signal from the means for detecting and for indicating the percent change of resistance.

3,882,852
SURGICAL DILATORS HAVING INSUFFLATING MEANS

Manfred Sinnreich, 160 Fort Hill Rd., Scarsdale, N.Y. 10583

Filed Jan. 11, 1974, Ser. No. 432,666
Int. Cl. A61m *3/00, 29/00*
U.S. Cl. 128—4 **5 Claims**

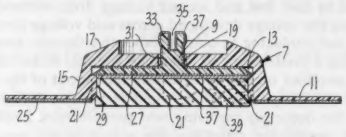


1. A combination surgical dilating and endoscopic device comprising: a rigid shaft element having proximal and distal ends bordering an outer surface, an expandable element surrounding said shaft element and secured to said outer surface, means supplying an inflating medium to said expandable element communicating therewith, and means for determining the degree of inflation of said inflatable element, said shaft element penetrating said inflatable element and defining a longitudinal bore extending substantailly the length thereof; and an endoscopic element having an elongated barrel within the bore of said rigid shaft element and capable of longitudinal movement relative thereto; whereby said device may be inserted into a body opening to a position in which said inflatable element is positioned within a body cavity, following which said expandable element is expanded to correspondingly expand said body cavity, and said endoscope is manipulated relative to said rigid shaft element to perform a required surgical function.

3,882,853
BIOMEDICAL ELECTRODE

John W. Gofman, and Richard F. Gianni, both of Dublin, Calif., assignors to Cardiodynamics, Inc., Dublin, Calif.

Continuation of Ser. No. 332,720, Feb. 15, 1973, abandoned. This application June 13, 1974, Ser. No. 479,112
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 E 8 Claims



1. A body electrode comprising in combination:

a. a base member made of a single piece of a flexible, soft plastic having a thin flexible rim portion and a rigid center flat bottomed cup-like member defined by heavy sidewalls and a heavy top,

b. a snap comprising a relatively thin flat disc of conductive material lying on the flat bottom of the cup-like member, and having a terminal extending through the face of the cup-like member,

c. a thin sheet of porous non-conductive material of substantially the same size as the flat bottom of the cup-like member, and having one surface in contact with said disc,

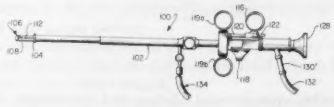
d. a thick disc of porous foam-like material in contact with said porous nonconductive material and filling the remainder of the cavity of the cup-like member and extending a substantial distance beyond the open end of the cup-like member, said foam-like material being saturated with an electrically conductive material, and

e. means for attaching said cup to a human body by the outer thin wide rim whereby said foam-like material is brought into compression within the cup-like member by pressure from the body.

3,882,854
SURGICAL CLIP AND APPLICATOR

Jaroslav Fabian Hulka, Chapel Hill, N.C., and George Selden Clemens, Northfield, Ill., assignors to Research Corporation, New York, N.Y.

Filed Aug. 23, 1973, Ser. No. 390,861
Int. Cl. A16b 1/06; A61b 17/08, 17/10
U.S. Cl. 128—6 10 Claims

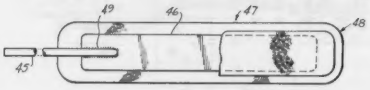


1. A surgical clip and actuator for occluding tubes in a living animal said clip comprising first and second jaw members; means adjacent one end of each jaw member pivotally mounting the other ends of said jaw members for movement toward and away from each other; a generally U-shaped spring member engaging remote surfaces of each jaw member and slidable from a first position on one side of the said pivotal mounting, to urge said jaw members into the open arrangement, to a second position on the other side of the said pivotal mounting, to urge said jaw members into the closed position; and said actuator including a cradle for said clip and first and second manually operable rods; said first rod adapted to contact a top surface of said first jaw member and to urge said jaw member toward said second jaw member against the urging of said U-shaped spring when said spring is in said first position; and said second rod positioned to urge said U-shaped spring into said second position.

3,882,855
RETRACTOR FOR SOFT TISSUE FOR EXAMPLE BRAIN TISSUE

Rudolf R. Schulte, Goleta, Calif., and Harold D. Portnoy, Bloomfield Hills, Mich., assignors to Heyer-Schulte Corporation, Goleta, Calif.

Filed Nov. 12, 1973, Ser. No. 414,909
Int. Cl. A61b 17/02
U.S. Cl. 128—20 12 Claims

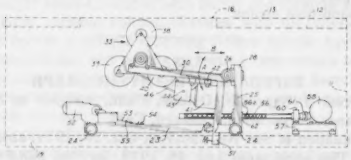


1. A retractor for tissue comprising: a deformable metal blade having a pair of opposite faces and a peripheral edge bounding and interconnecting said faces; and a sheath enveloping at least a part of said blade, said sheath comprising a cover portion covering at least said part of both faces of said blade and having an exposed bearing face for bearing against brain tissue, and a skirt portion extending from said cover portion and projecting to a free edge beyond said peripheral edge, said portions comprising a material which is nonadherent to brain tissue the skirt being thinner adjacent to its free edge than it is adjacent to the peripheral edge of the blade and being sufficiently flexible as to bend upon contact with soft tissue such as brain tissue without cutting, tearing, or bruising said tissue.

3,882,856
THERAPEUTIC MANIPULATING MACHINE FOR THE HUMAN BODY

Gordon D. Heuser, 2514 Stacy Ct., Colorado Springs, Colo. 80915, and Rolla J. Pennell, 3320 Coyster Dr., Independence, Mo. 64052

Filed Nov. 23, 1973, Ser. No. 418,362
Int. Cl. A61h 15/00
U.S. Cl. 128—57 3 Claims



1. A therapeutic manipulating machine for massaging and manipulating portions of a patient's body, such as the spinal column, to release joint fixations and condition muscles, the machine comprising:

a. a table means having a flat, planar, upper surface and a centrally located, elongated rectangular opening therein, said table means being supported above a floor surface by a suitable framework means,

b. a carriage means disposed below said table means and mounted on parallel, longitudinal guide rail means positioned along each side of said framework means for longitudinal movement with respect to said rectangular opening,

c. massaging and manipulating means rotatably mounted on said carriage means and arranged to extend upwardly through said opening to massage and manipulate a portion of a patient's body lying on said table means, said massaging and manipulating means includes a first power

means for rotating said massaging and manipulating means during operation, said massaging and manipulating means includes at least about three parallel rollers having a length generally corresponding to the width of said rectangular opening and mounting means supporting said rollers in a polygonal drum-like configuration with their axes aligned with said rectangular opening so that, as the mounting means is rotated, each of said rollers will freely rotate and sequentially rotate through said rectangular opening and press against said body portion so as to provide an oscillating pressing action against said body portion,

d. means for adjusting the upward force with which said massaging and manipulating means presses against said body portion, so as to vary the massaging and manipulating action, and

e. reciprocating means for moving said massaging and manipulating means continuously in a back and forth motion longitudinally along said opening to massage and manipulate a large area of the body.

3,882,857

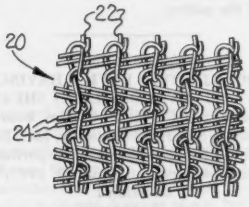
ORTHOPEDIC CAST HAVING PROTECTIVE SLEEVE

Hubert C. Woodall, Jr., Winston-Salem, N.C., assignor to Carolina Narrow Fabric Company, Winston-Salem, N.C.

Filed Dec. 29, 1969, Ser. No. 888,441

Int. Cl. A61f *13/04*

U.S. Cl. 128—90 **4 Claims**



1. An immobilizing orthopedic cast characterized by air permeability and non-wettability and thereby permitting air ventilation to the surface of the skin of a wearer and being quick to dry upon exposure to water, said cast comprising,

an inner protective sleeve adapted to be positioned about a portion of the body of a wearer and comprising a relatively open, soft, resilient, air permeable fabric formed of interknit non-wetting, polymeric yarns, and

an outer immobilizing structure surrounding said sleeve and comprising a plurality of superposed, rigid layers of a relatively open, air permeable non-wetting fabric adhered together and including interlaced glass yarns.

3,882,858

SURGICAL SYNTHETIC-RESIN MATERIAL AND METHOD OF TREATING OSTEOMYELITIS

Klaus Klemm, Frankfurt/Main, Germany, assignor to Merck Patent Gesellschaft mit/beschraenkter Haftung, Darmstadt, Germany

Filed Apr. 17, 1974, Ser. No. 461,654

Claims priority, application Germany, Apr. 21, 1973, 2320373

Int. Cl. A61f *5/04*

U.S. Cl. 128—92 G **15 Claims**

1. A method of treating osteomyelitis which comprises implanting in an osteomyelitic cavity sterile particles having a diameter of 1 – 20 mm. of a solid physiologically acceptable bone cement impregnated with at least one topically effective antibiotic.

3,882,859

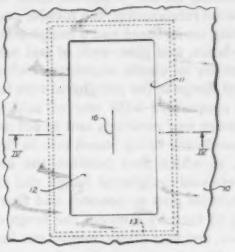
ELASTIC FENESTRATED DRAPE

Richard E. Ericson, Nashua, N.H., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed June 4, 1973, Ser. No. 366,746

Int. Cl. A61f *13/00*

U.S. Cl. 128—132 D **2 Claims**



1. A surgical drape for use over a patient, which comprises a main cover formed from thin material resistant to the passage of bacterial organisms there-through, said cover having a large fenestration therein; and a thin sheet of elastomeric material secured to the under surface of said cover along a seal line adjacent to the edge of said fenestration, said latter material being limp for conforming to the adjacent body surface of said patient and having lower and upper anti-skid surfaces for non-skid engagement with said body surface to retain said drape on said patient, and to provide a non-skid instrument receiving field and being formed from stretchable material to permit the area of an opening cut therein to be increased for exposing an operative site on the patient's body wherein the elastomeric material is a copolymer of styrene and butadiene.

3,882,860

REANIMATION DEVICE

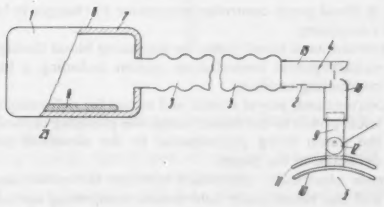
Eckart Frimberger, Cramer-Klettstrasse 2, D-8014 Neubiberg, Germany

Filed Apr. 12, 1973, Ser. No. 350,519

Claims priority, application Germany, Apr. 12, 1972, 2217614; Sept. 20, 1972, 2245993

Int. Cl. A61h *31/00*

U.S. Cl. 128—145.7 **13 Claims**



1. In a resuscitation device for an alternative respiration and external cardiac massage of a patient, comprising a compressible and self-expanding reanimation bag, an adaptation piece for the breathing passage of a patient, a connecting tube connecting said bag to said adaptation piece, a one-way suction valve provided in the assembly defined by said bag and said connecting tube to fill said bag with fresh air during the expansion stroke of said bag, and a double valve provided between said connecting tube and said adaptation piece and adapted to allow the flow of fresh air from said bag into the lungs of the patient when the bag is being compressed, and the

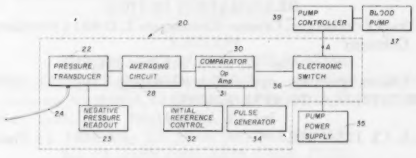
re-flow of said air from the lungs of the patient to the ambient air as soon as the bag has reached its collapsed condition, the improvement residing in that said double valve comprises a housing having a first opening leading to the ambient air, a second opening leading to said bag and a third opening leading to the patient, said first and second openings being aligned and provided in opposite walls of said housing and surrounded by inwardly extending tubular posts, the inner ends of which are aligned in spaced relationship, the tubular post of said second opening bearing on its inner end a peripheral flange provided with through-holes, said inner ends of said tubular posts forming valve seats for an elastic membrane, which is fastened to said peripheral flange in the peripheral area thereof and which alternatively cooperates with one of said tubular posts to alternate between two positions and to act as a double valve, said elastic membrane being biased into its first position by its elastic force, in which first position the elastic membrane sealingly covers said peripheral flange and said inner end of said second tubular post to connect said first opening to said third opening to thereby connect the lungs of the patient to the ambient air, and said elastic membrane being brought into its second position by the air flow from said bag, in which second position the elastic membrane sealingly covers the tubular post of said first opening to connect said second opening via said through-holes to said third opening to thereby connect said bag with the lungs of the patient, the cross-sectional area of the tubular post of said second opening leading to said bag being the same or larger than the total cross-sectional area of said through-holes in said peripheral flange.

3,882,861

AUXILIARY CONTROL FOR A BLOOD PUMP

Donald E. Kettering, Salt Lake City, and Morris E. Jones, Bountiful, both of Utah, assignors to Vital Assists, Inc., Salt Lake City, Utah

Filed Sept. 24, 1973, Ser. No. 399,904
Int. Cl. A61m *01/03*
U.S. Cl. 128—214 E **7 Claims**



1. A blood pump controller responsive to changes in blood flow comprising:

a conventional blood pump for displacing blood through an extracorporeal hemodialysis system including a blood-conducting conduit;

a conventional power source and means for delivering electrical power to the blood pump, the pumping capacity of the pump being proportional to the electrical power delivered to the pump;

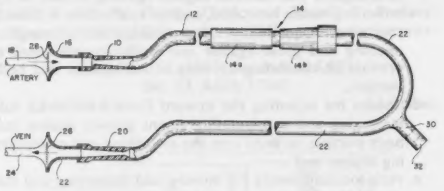
means electrically interposed between the power source and the blood pump said means comprising an attachment site means for detachably coupling the blood pump to the power source through the said means; sensing means in said blood-conducting conduit for monitoring the availability of extracorporeal blood to the pump upstream from the pump; and means responsive to the sensing means for selectively and continuously varying the amount of electrical power delivered to the blood pump from the power source thereby continuously varying the pumping flow rate of the blood pump, the magnitude of pumping variation being constantly proportional to extracorporeal blood flow upstream from the blood pump during the course of dialysis.

3,882,862

ARTERIOVENOUS SHUNT

Olga Berend, 6311 Drexel Ave., Los Angeles, Calif. 90048

Filed Jan. 11, 1974, Ser. No. 432,462
Int. Cl. A61m *05/00*
U.S. Cl. 128—214 R **5 Claims**



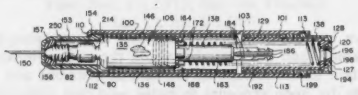
1. An arteriovenous shunt for hemodialysis patients, and the like, comprising: elongated tubular means having an entrance end and an exit end creating a fluid-circulating path between the entrance end and the exit end; an elongated tube having one end attached to the entrance end of said elongated tubular means and having an inner surface flared outwardly from the other end thereof towards said one end to create a Venturi effect and thereby prevent turbulence in the fluid circulating therethrough; and a flexible tubular cuff having one end attached to the other end of said elongated tube and having an outwardly flared opposite end to be sutured to a severed duct in the body of the patient.

3,882,863

HYPODERMIC INJECTION DEVICE HAVING CANNULA COVERED WITH RESILIENT SHEATH

Stanley J. Sarnoff, and George B. Calkins, both of Bethesda, Md., assignors to Survival Technology, Inc., Bethesda, Md.

Filed Aug. 1, 1973, Ser. No. 384,682. The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.
Int. Cl. A61m *5/20*
U.S. Cl. 128—218 F **7 Claims**



1. In a hypodermic injection device comprising a gun, a cartridge holder in operative relationship to the gun, a cartridge within the holder, said gun comprising a sleeve open at one end thereof, a plunger positioned within the sleeve, spring power means acting on said plunger tending to move it out the open end of the sleeve, restraining means cooperating with said plunger to prevent plunger movement, safety means acting on said restraining means to render it inoperative, said cartridge holder comprising a hollow shell acting as a prolongation of the gun sleeve, said cartridge including an ampoule comprising a hollow cylindrical sleeve, a piston slidably positioned in one end thereof and means mounting a cannula extending from and closing off the other end, a fluid within the cylindrical sleeve between the piston and the cannula, the cartridge fitting within the cartridge holder with the free end of the cannula within the end of the holder remote from the gun, the improvement comprising:

a resilient sheath covering the cannula, said sheath having a closed end and an open end, the length of the sheath being sized such that when assembled on the cannula the closed end of the sheath is not pierced by the cannula end, and means for preventing forward movement of the closed end of the sheath whereby when the power means forces the cartridge forward the cannula will pierce the

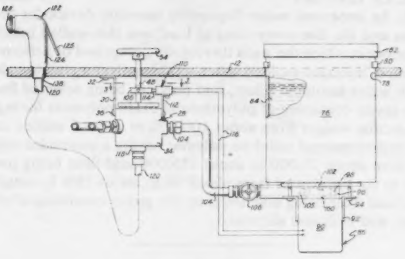
closed end of the sheath and deliver the fluid medicament from the ampoule sleeve.

3,882,864

SELECTIVELY OPERATED PRESSURIZED LIQUID APPLICATOR FOR SINK INSTALLATION

George R. Montgomery, 1152 Okeechobee Rd., West Palm Beach, Fla. 33401

Filed Aug. 17, 1973, Ser. No. 389,344
Int. Cl. A61m *1/00*
U.S. Cl. 128—230 6 Claims



6. A pressurized liquid applicator system comprising a support, a rotary selector valve assembly attached to the support and having a manipulating handle, a tank for a liquid medicament mounted on the support and including a delivery pump, said rotary selector valve assembly having a liquid inlet which is fluid coupled with said delivery pump, hot and cold water conduits adjacent said support, said selector valve assembly having additional liquid inlets which are fluid coupled to said conduits, said rotary selector valve assembly having a liquid outlet common to said first and second named liquid inlets, said valve assembly including a rotary member coupled to said manipulating handle and having a port movable selectively into registration with any one of said liquid inlets and having a passage communicating with said port and being in registration with said liquid outlet, an extensible hose terminating in a liquid applicator and coupled with said liquid outlet of said selector valve assembly, said support including a rest portion for the liquid applicator of the hose, and control means for said delivery pump activated in response to rotation of said manipulating handle.

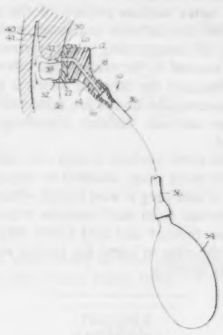
3,882,865

FLUSHING DEVICE FOR DENTAL BRIDGES

George Christou Hatzitheodorou, 93-27 Elderts Ln., New York, N.Y. 11421

Filed June 4, 1974, Ser. No. 476,202
Int. Cl. A61m *1/00*
U.S. Cl. 128—232 17 Claims

1. A flushing device for a dental bridge comprising a flushing head tapering rearwardly to define a reduced neck, the head provided with a broad, substantially flat, frontal surface for abutment against the side of the bridge and the corresponding gum and provided intermediately with a transverse slot adapted to come in registry with the interspace between the bridge and the gum, a central channel disposed through the head to provide intercommunication between the neck and the discharge slot, with the channel enlarging in the direction of the discharge slot to the configuration thereof, a liquid source adapted for discharge under pressure, and a flexible tube connecting the liquid source with the neck of the flushing



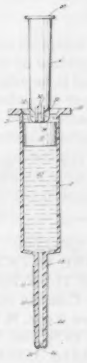
head, whereby liquid is directed through the discharge slot under pressure to flush the interspace.

3,882,866

ENEMA SYRINGE

Eli A. Zackheim, 120 Platt Ave, Norwich, Conn. 06360

Continuation of Ser. No. 150,988, June 8, 1971, abandoned. This application July 20, 1973, Ser. No. 381,063
Int. Cl. A61m *1/00*
U.S. Cl. 128—235 5 Claims



1. A disposable catheter for use in flushing a body cavity comprising:

1. a syringe barrel open at one end and a cannula fixed thereto at the other end thereof;
2. said barrel adapted to have placed and contained therein a flushing solution;
3. a through bore in said cannula communicating with said barrel and the solution therein;
4. a movable plug positioned to close off the open end of the barrel and having engageable means at one end thereof facing said open end of the barrel;
5. a cannula cover mounted on said cannula, said cover having an innercross section along its entire length which is greater than the cross section of the cannula to define a discreet annular space between the cover and the cannula along its entire length, and an inner plug formed in one end of said cover and inserted in said through bore

of said cannula when the cover is positioned thereon for sealing said bore;

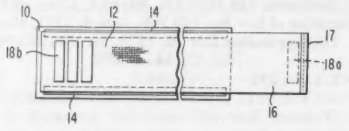
6. a lubricant contained in said cover and surrounding and coating the outer surface portion of the cannula in the space between the cannula and cover, said cover having first and second cooperating means formed thereon, one of which is located in the end of said cover remote from said inner plug and the other of which is located on said cannula adjacent said barrel for removably securing the cover to the cannula without disturbing the lubricant thereon; and

7. means on the outer surface of said one end of said cover, adjacent said inner plug, adapted to engage the engageable means of said plug in siad barrel, whereby said cover may be removed from said cannula exposing the lubricated portion thereof and said cover may function as a plunger for the plug to expel the enema solution through the cananula opening.

3,882,867
LEG WRAP

Harold J. Moran, Trenton, N.J., assignor to Troy Equine Products, Bordentown, N.J.

Filed Feb. 13, 1974, Ser. No. 442,054
Int. Cl. A61f *7/00*
U.S. Cl. 128—254 **12 Claims**

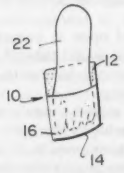


1. A wrap for use as a compress comprising a layer of dry absorbent material characterized by its ability to expand when moistened and dimensioned to be wrapped around an appendage of an animal, and a layer of reinforcing material overlying said layer of absorbent material and secured thereto to hold the absorbent material confined in contact with the surface to which it is applied, said reinforcing material having means thereon for holding the wrap in place when moistened to cause the absorbent material to expand.

3,882,868
DISPOSABLE FOOT CARE ARTICLE AND METHOD OF MANUFACTURE THEREOF

Werner O. Tundermann, Colonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,297
Int. Cl. A61m *35/00, 37/00*
U.S. Cl. 128—260 **11 Claims**



1. A disposable toe cover of non-woven material comprising a single sheet impregnated with anti-microbial and deodorant agents on one surface thereof, said sheet being folded to define a front edge with an upper portion and a lower sole portion having the impregnated surfaces facing each other said upper portion being continuous and coextensive with said sole portion, and said folded sheet having its side edges sealed to each other, said side edges being defined by parallel straight lines, one of said side edges extending at an acute angle from said front edge, the other of said side edges extending at an obtuse angle from said front edge.

3,882,869
WATER-DISPERSIBLE PLASTIC TAMPON INSERTION TUBES AND THE LIKE

David E. Hanke, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

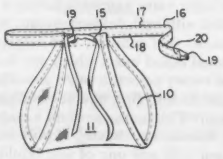
Continuation of Ser. No. 21,195, March 19, 1970, abandoned. This application Jan. 31, 1972, Ser. No. 222,117
Int. Cl. C08h *9/00;* **C08b** *27/44*
U.S. Cl. 128—263 **7 Claims**

1. An improved water-dispersible insertion device for tampons and the like comprising at least one thin-walled tubular member in which the walls thereof are comprised of a thermoformed, injection-molded water-soluble polymer compounded with water-insoluble fillers, said polymer being selected from the group consisting of polyethylene oxide polymers having a molecular weight from about 100,000 to about 2 million and an hydroxypropyl cellulose polymer having a molecular value of from about 75,000 to about 375,000 said filler being present in the amount of from about 50 to about 75% by weight, and said filler being selected from the group consisting of talc, clay, and hydrated silicates.

3,882,870
DIAPER

Lucille Hathaway, 4855 Monroe St., Lot 612, Toledo, Ohio 43623

Division of Ser. No. 161,140, July 9, 1971, abandoned. This application Feb. 22, 1974, Ser. No. 444,898
Int. Cl. A61f *13/16, 5/44*
U.S. Cl. 128—284 **4 Claims**



1. A diaper particularly adapted for adult use, comprising

a textile fabric body of bias cut to afford lateral resilient flexiblity and having a front panel flap, the upper marginal edge of said fabric body being slightly wider than the upper marginal edge of said front panel and that rear portion of the fabric body adjacent the upper marginal edge portion of the fabric body having side edges outwardly contoured to afford a larger seat area, the front panel being folded toward the rear body portion when in position of use,

a waist band of textile fabric secured intermediate its ends to the edge portion of said upper end portion of the fabric body with the free end portions thereof extending outwardly in opposite directions substantially beyond the upper end portion of the fabric body and constituting the principal waist-engaging portion of the diaper,

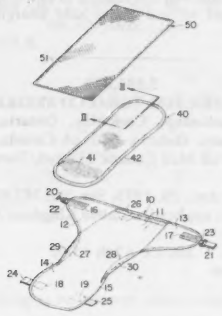
an apertured device on each free end of said waist band, and

a single tie string secured intermediate its ends to the free end portion of said front panel, thereby providing two tie portions adapted to be threaded respectively through the said apertured devices of the waist band and then tied together for securing the diaper upon the body of the wearer thereof.

3,882,871
DIAPER SET

Takasi Taniguchi, 8-26-2, Miyakajim-Hondori, Miyakojima-ku, Osaka-shi, Japan

Filed May 15, 1973, Ser. No. 360,476
Int. Cl. A61f 13/16
U.S. Cl. 128—287 2 Claims



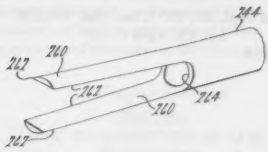
1. An infant's diaper set comprising, in a freely separable combination: a water-repellent but gas-permeable cover generally trapezoidal in outline; said cover having arcuate cutaways along its side edges to provide leg openings when applied to an infant; a pad consisting of a cotton fabric having a number of parallel corrugations of high density formed on its faces; and a hydrophobic net fabric for direct contact with the infant's body; said cover being made of a fabric formed of synthetic-fiber yarns coated with an organosilicone polymer and provided at said cutaways with additionally outwardly extending attaching members to enclose the infant's legs, attached with seams to said cutaways in a stretched condition; said cover further including a fastening member secured to the inner side thereof at its widest upper points and to its outer side at the widest lower points, to thereby form a fastening assembly when engaging each other, so that said upper and said lower cover portions are secured in a closed position in use on the infant's body; said fastening members at said lower points being marginally outwardly extended with the absence of fastening piles secured thereto, thereby to prevent a certain number of disengaging fastening piles on the corresponding fastening member on said upper portion from directly contacting the infant's body; said net fabric being formed of filamentary yarns of a polyvinyl-chloride material.

3,882,872
METHOD AND APPARATUS FOR CATARACT SURGERY

Nicholas G. Douvas, 4200 N. Gratiot, Port Huron, Mich. 48050, and Henry T. Dinkelkamp, 200 W. Ardard Place, Prospect, Ill. 60056

Continuation-in-part of Ser. No. 643, Jan. 5, 1970, abandoned. This application Apr. 25, 1973, Ser. No. 354,376
Int. Cl. A61b 17/32
U.S. Cl. 128—305 36 Claims

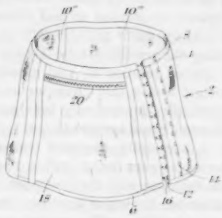
1. An axially-extending cutting tip for a surgical instrument having a body and a rotary shaft mounted on said body, said cutting tip comprising a stator tube, an opening in the side wall of said stator tube defining a generally axially extending sharp cutting edge, and a rotor within said stator tube comprising at least one axially extending finger at the forward end thereof, a generally axially extending sharp cutting edge on said finger cooperative with the cutting edge of said stator tube when said rotor rotates within said stator tube, said finger being constrained by said stator tube to bias said finger cutting edge against the side wall of said stator tube.



3,882,873
HEAT AND COLD APPLICATOR

Olga Arango, Miami, Fla.

Filed July 24, 1972, Ser. No. 274,267
Int. Cl. A61m 5/00
U.S. Cl. 128—379 4 Claims



1. A body support garment for altering temperature of portions of a human torso comprising:
- a band of fabric having a length and width sized to encircle a human torso, said band having an elastic portion for supporting the abdominal area of the torso;
- a connecting means coupled to the distal ends of said band for securing said band about the human torso, said band having an elastic pocket disposed over the elastic portion; and
- a flexible, water retaining bag removeably disposed in said pocket.

3,882,874
TOBACCO EXPANSION PROCESS

James D. Frederickson; Ella Sue Hickman, and Edward D. Harper, all of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Division of Ser. No. 860,014, Sept. 22, 1969, abandoned. This application June 1, 1972, Ser. No. 258,747
Int. Cl. A24b 3/18, 15/00
U.S. Cl. 131—140 P 4 Claims

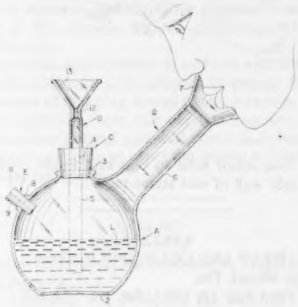
1. A process of increasing the filling capacity of tobacco which comprises impregnating at substantially ambient pressure a mass of discrete tobacco particles in the form of shreds, strips, leaves or stems with an organic dicarboxylic acid or a derivative thereof, rapidly heating the mass of impregnated tobacco to an elevated temperature whereby said organic compound is chemically decomposed to liberate a gas within the individual tobacco particles and said discrete particles are thereby expanded without appreciable disintegration.

3,882,875

SMOKING PIPE

Charles W. Frost, c/o Donald F. Frost, 26 S.W. 6th St., Miami, Fla. 33130

Filed Sept. 20, 1973, Ser. No. 399,330
Int. Cl. A24f *01/30*
U.S. Cl. 131—173 10 Claims



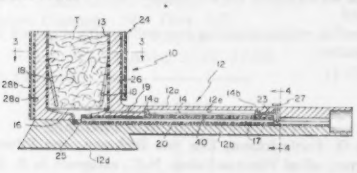
1. A smoking pipe having a portion adapted to contain a liquid through which smoke can be drawn, said pipe including means defining a liquid-receiving chamber having a bottom, a projecting mouthpiece connected to and extending from an upper portion of said chamber and directly and uninterruptedly communicating therewith, a tube means connected to said chamber in spaced relation to said mouthpiece and including a first portion above said chamber and another portion extending vertically downwardly into said chamber in sealing relation therewith and terminating at a point above the bottom thereof, a vertically disposed smoking material-receiving bowl having a lower outlet orifice directly and uninterruptedly communicating with the first portion of said tube means and said chamber having at least one finger controllable atmospheric air-admitting orifice means spaced from said mouthpiece and tube means, located at and communicating with the interior of an upper portion of said chamber.

3,882,876

SMOKING PIPE

Edwin G. Covington, 3401 Roberts St., Saginaw, Mich. 48601

Filed Oct. 23, 1973, Ser. No. 408,389
Int. Cl. A24f *01/00, 03/00*
U.S. Cl. 131—185 6 Claims



1. A smoking pipe comprising:

a. an upstanding tobacco receiving bowl having a tobacco receiving chamber defined by a side wall and a lower end;

b. generally horizontally extending hollow stem means which define a passage having an axis and having means communicating with said chamber, said stem means comprising first and second partible stem sections which are axially split, a first stem section being integrally formed with said bowl and a second stem section being axially slidably movable thereon between a remote position and a position in which said stem sections cooperate to define said passage;

c. electrically energizable tobacco igniting means in the lower portion of the bowl, battery means mounted in one of said stem sections and electrical conductive means lining the inside of the other stem section and connected in circuit with said battery means and said igniting means; and

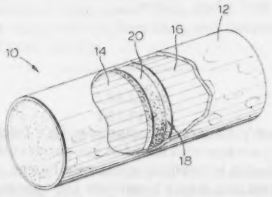
d. tubular port means provided in said side wall for introducing air to tobacco received within said chamber, said port means downwardly depending from an interior surface of said side wall and leading to said lower end of said bowl adjacent to and above said energizable igniting means.

3,882,877

FILTER FOR TOBACCO SMOKE

Warren A. Brackmann, Cooksville, Ontario, and Daniel DiIanni, Toronto, Ontario, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Ontario, Canada

Filed Apr. 20, 1973, Ser. No. 352,868
Claims priority, application United Kingdom, Apr. 26, 1972, 19495/72
Int. Cl. A24b *15/02*
U.S. Cl. 131—266 5 Claims



1. A self-sustaining filter for tobacco smoke comprising a plurality of filter elements, and including a substantially air-tight tubular holder, a pair of cylindrical cellulose acetate filter elements positioned within and in contact with the inner wall of the holder, said pair of filter elements being spaced apart from each other to define a gap therebetween, said pair of filter elements and said tubular holder combining to provide sufficient crush-resistance to provide a self-sustaining filter, and a third filter element consisting wholly of a plurality of randomly-oriented, non-crimped, smooth-surfaced, solid fibers of a thermoplastic polymeric non-absorbent material selected from polyolefins, polyesters, polyamides and polystyrene, each of said fibers having a uniform diameter less than about 5 microns, with substantially all of the fibers being below 2 microns in diameter and having an average fiber diameter of about 1 micron, the majority of the said fibers being oriented transverse to the flow of the tobacco smoke, said third filter element being positioned in the gap between said pair of filter elements, said third filter element having a diameter substantially that of said tubular holder and being in engagement with said inner wall.

3,882,878

METHOD FOR PREPARING CIGARETTE FILTER OF CELLULOSE ACETATE FIBERS

Hideo Sawada, and Junji Kawamoto, both of Sakai, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Aug. 22, 1973, Ser. No. 389,084
Int. Cl. A24b *15/02*
U.S. Cl. 131—267 10 Claims

1. A method for preparing a cigarette filter of cellulose acetate fibers which comprises blooming a tow composed of cellulose acetate fibers, distributing uniformly throughout the bloomed tow from 1 to 20% by weight, based on the cellulose acetate fibers, of a plasticizer comprising as an ingredient at

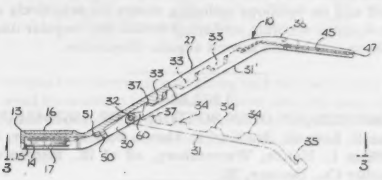
least one member selected from the group consisting of the diacetate, dipropionate and dibutyrate esters of 1,3-butylene glycol, and gathering the thus-treated bloomed tow to form a filter.

3,882,879

DENTAL FLOSSING INSTRUMENTS

Jack R. Lucas, 6500 Sepulveda Blvd., No. 103, Van Nuys, Calif. 91401

Filed Apr. 2, 1973, Ser. No. 346,725
Int. Cl. A61c *15/00*
U.S. Cl. 132—92 R **14 Claims**



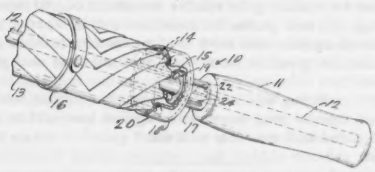
1. A dental flossing instrument which comprises:
a. a body;
b. a pair of spaced tines protruding from said body, said tines being spaced a predetermined distance and adapted to hold a span of floss therebetween;
c. means for securing a length of floss at two spaced points along said length of floss, said spaced points encompassing said span of floss; and
d. means for generating tension in said length of floss between said secured points which comprises a pair of mating members, the path of said length of floss being between the mating portion of said mating members, said portion of said length of floss being engaged by said mating members to cause the path of said portion of said length of floss to deviate from a straight line thereby increasing path length.

3,882,880

UMBRELLA TIP CUP

H. Franklin Waltz, Toledo, Ohio, assignor to Haas-Jordan Company, Toledo, Ohio

Filed June 14, 1974, Ser. No. 479,466
Int. Cl. A45b *25/00*
U.S. Cl. 135—44 **6 Claims**



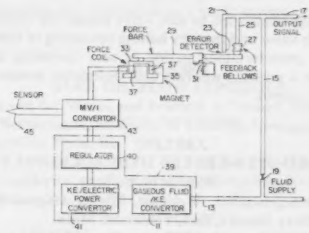
1. In an umbrella having a central pole, collapsible over material and a plurality of support ribs depending from the upper part of the pole, such support ribs having tips at their lower ends which, in the closed configuration of the umbrella, conjoin together about the pole, the improvement comprising an annular tip cup and an annular cup-supporting sleeve concentrically positioned on the pole adjacent the rib tips, said tip cup having an outer tip-engaging annular flange and a central bore defining an inner annulus, said support sleeve having means superimposed on its outer surface for slidably receiving the inner annulus of said tip cup in an interference fit when said tip cup is moved axially upward in concentric relationship over said support sleeve to engage the rib tips, and spacer means on its inner surface, peripherally spaced from said superimposed outer sleeve means, for engaging the pole and maintaining a spacing between the pole and the inner annulus of the sleeve when said tip cup is received by said superimposed outer sleeve means in such interference fit, whereby upon receiving said tip cup, said support sleeve is deflected by inward pressure on said superimposed outer surface means and exerts an outward pressure on the inner annulus of said tip cup.

3,882,881

PNEUMATIC TRANSMITTER OF ELECTRICAL PHENOMENA

Donald D. MacKenzie, Middlebury, and John L. Russell, Waterbury, both of Conn., assignors to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Jan. 12, 1973, Ser. No. 323,284
Int. Cl. G05d *10/16, 23/22*
U.S. Cl. 137—14 **15 Claims**



1. An apparatus for converting an electrical signal for the fluid transmission thereof comprising: a source of fluid under pressure, means for converting the energy of said fluid to electrical energy, said electrical energy being in the form of a DC current, means for sensing a physical condition and for generating an electrical signal representative thereof, means for modulating said DC current in accordance with said electrical signal representative of said sensed condition, conduit means for channelling off a portion of said fluid at said source, said channelled fluid having an input pressure and output pressure, and means for varying the output pressure of said channelled fluid in accordance with said modulated electrical current.

3,882,882

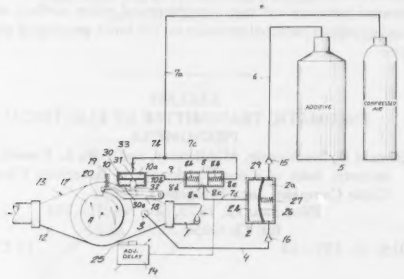
SYSTEM FOR METERING A SUBSTANCE INTO LIQUID FLOWING IN A CONDUIT

Jurg Preisig, Herisau, Switzerland, assignor to Dr. Wrede & Co., Standard-Messgerate Fabrikation, Werl, Germany

Filed Aug. 24, 1973, Ser. No. 391,160
Claims priority, application Germany, Aug. 26, 1972, 2242165
Int. Cl. B67d *5/08;* **G01f** *11/08*
U.S. Cl. 137—98 **6 Claims**

1. A system for introducing an additive into fluid passing through a conduit, siad system comprising:
flowmeter means in said conduit having an operating element which rotates at a rate proportional to volume rate of fluid flow in said conduit for generating a periodic output having a frequency proportional to said volume rate of flow;
pneumatically operable pump means connected to a source of said additive and including a fluid line connected to said conduit for injecting a predetermined quantity of said additive into said conduit through said fluid line;
valve means including a pilot valve connected to said flowmeter means and to said source of pressurized gas and a follower valve connected to said pilot valve, to said source of pressurized gas and to said pump means for

pneumatically operating said pump means each time said flowmeter means generates an output, said pilot valve having a membrane formed with a pinpoint orifice; and



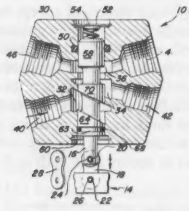
reset means connected to said valve means for closing said follower valve and thereby halting operating of said pump after a predetermined period of said operating element being in a position wherein said flowmeter means generates an output.

3,882,883

CLOSED-OPEN CENTER HYDRAULIC VALVE ASSEMBLY

James T. Droegemueller, Welcome, Minn., assignor to Fairmont Railway Motors, Inc., Fairmont, Minn.

Filed Nov. 19, 1973, Ser. No. 417,410
Int. Cl. F16k *11/07, 3/24*
U.S. Cl. 137—270 **10 Claims**



1. A valve for use in fluid control systems comprising a valve body, a valve spool and means for reciprocally moving the spool between predetermined off and on positions in said valve body;

a. said valve body comprising a housing having a plurality of chambers therein and an interrupted bore for receiving said valve spool and connecting said chambers so as to provide fluid communication therebetween depending upon the reciprocal movement of said spool and the angular disposition thereof about the common axis of the spool and bore, said chambers including,

i. a receiving chamber having an inlet for receiving fluid from a source thereof, and

ii. an adjacent chamber disposed to receive the fluid from the receiving chamber via said bore,

the walls of the bore between said receiving chamber and said adjacent chamber being obliquely aligned with the axis of the bore so as to present a longitudinally offset surface;

b. said valve spool having at least a first land thereon configured so that,

i. in the off position said land sealingly registers with said obliquely aligned wall in at least a first angular disposition of the spool about said common axis whereby the passage of the bore between said receiving and said adjacent chambers is substantially closed to fluid flow,

ii. in the off position said land is out of sealing registration with at least a substantial portion of said obliquely aligned wall in at least a second angular disposition of the spool about said common axis whereby the fluid may flow through the passage of the bore between said receiving chamber and said adjacent chamber, and

iii. in the on position said land is out of sealing registration with at least a substantial portion of said obliquely aligned wall in both said first and said second angular dispositions of the spool; and

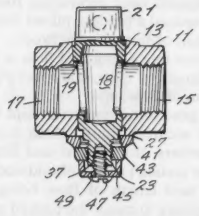
c. said means for reciprocally moving the spool between the off and on positions including means for selectively and releasably securing said spool in said first angular disposition and in said second angular disposition.

3,882,884

TAMPERPROOF OPEN BOTTOM STOP ASSEMBLIES

Wilbur R. Leopold, Jr.; Carl E. Floren, both of Decatur, and William L. Hauffe, Warrensburg, all of Ill., assignors to Mueller Co., Decatur, Ill.

Filed Dec. 4, 1973, Ser. No. 421,727
Int. Cl. F16k *39/00*
U.S. Cl. 137—327 **10 Claims**



1. A tamperproof open bottom valve comprising:

a housing member having a circular tapered valve seat provided with at least one flow passage therethrough,

a tapered plug member rotatable in said seat and having a flow passage movable into and out of registration with said flow passage of said housing to open and close said valve, respectively,

means for maintaining said tapered plug tightly seated against said tapered valve seat,

means for inhibiting the relative movement of said tapered plug and said means for maintaining said tapered plug seated against said valve seat to thereby prevent said maintaining means from being released from said plug, and

means including said inhibiting means for further moving said tapered plug downwardly against said seat as said plug and said seat wear with use.

3,882,885

METHOD OF HANDLING A LARGE DIAMETER SLURRY HOSE SYSTEM

David L. McCain, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

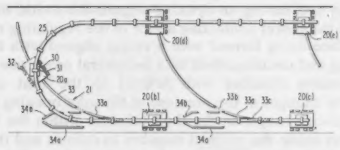
Filed July 25, 1973, Ser. No. 382,423
Int. Cl. B62d *3/00*
U.S. Cl. 137—344 **8 Claims**

1. In an apparatus for hauling a slurry system having a flexible hose system which extends from a fixed end to a movable end and a portion of the system is led through a storage and active loop to control slack of said hose system during movement of the slurry system movable end, the apparatus including motive means for supporting said hose system

from the floor of a mine, an improvement in said support system comprising:

a. a plurality of carts, each having means for powered locomotion;

b. clamping means for attaching each of said carts to said flexible hose system, said clamping means being rotatable in the horizontal plane relative to said carts; and



c. means for selectively energizing said means for said powered locomotion to reversibly move selected ones of said carts between storage position and an angularly oriented active position to maintain uniform loop of said hose system.

3,882,886

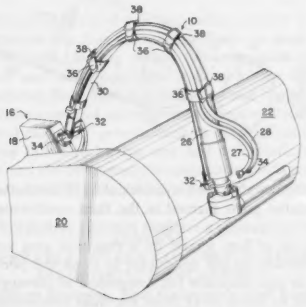
SUPPORT DEVICE FOR FLEXIBLE HOSES

Ronald E. Ely, and Warner G. Richardson, both of Joliet, Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Apr. 1, 1974, Ser. No. 456,972

Int. Cl. F16l *13/04*

U.S. Cl. 137—344 **9 Claims**



1. A supporting system for a flexible member extending between first and second relatively movable members and attached to said first and second relatively movable members at first and second ends of said flexible member, said supporting system including non-metallic band means extending between said first and second relatively movable members and attached respectively at opposite ends thereof for movement with said first and second movable members, said non-metallic band means including flexible strap means for flexible attachment to said flexible member, said flexible member and said non-metallic band means when secured together by means of said strap means form a self-supporting bundle capable of appreciable flexure in only one predetermined plane.

3,882,887

OPTICAL SELF-CHECKING LEVEL DETECTOR

Andre Rekai, Scarborough, Ontario, Canada, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 31, 1973, Ser. No. 411,587

Claims priority, application Canada, Feb. 26, 1973, 164562

Int. Cl. F16k *37/00*

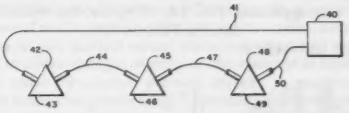
U.S. Cl. 137—386 **10 Claims**

1. An optical level sensing system for sensing the level of a material comprising:

means for supplying pulsating light;

light responsive sensor means;

transmitting means for transmitting said pulses of light to said light responsive sensor only as long as said material is below a predetermined level;



load terminals adapted to be connected to a load; and,

output means connected to said sensor for providing an output to said load terminals only upon cessation of said pulsating light.

4. The optical level sensing system of claim **1** wherein said load terminals are connected to a valve means.

3,882,888

FUEL OIL FLOW CONTROLS

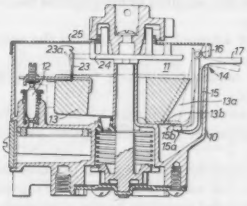
Jacobus van der Waals, and Petrus J. J. Toonen, both of Nijmegen, Netherlands, assignors to Controls Company of America, Schiller Park, Ill.

Filed Nov. 16, 1973, Ser. No. 416,413

Claims priority, application United Kingdom, Nov. 23, 1972, 54205/72

Int. Cl. F16k *31/26*

U.S. Cl. 137—410 **8 Claims**



1. An oil flow control device comprising

a housing defining a chamber for containing oil and having an inlet thereto,

an inlet valve,

a float,

means operatively connecting the float to the inlet valve to maintain a constant level of oil in the chamber, and

a safety device operable when the oil level exceeds a predetermined height to apply an upward force to the float, characterized in that the safety device comprises

a lever mounted on a horizontal pivot and comprising an operative arm and a counterbalance arm,

the operative arm of the lever, during operation of the device, extending downwardly and being partially immersed in the oil within the chamber, and

the counterbalance arm of the lever being located at all times above the oil level in the chamber,

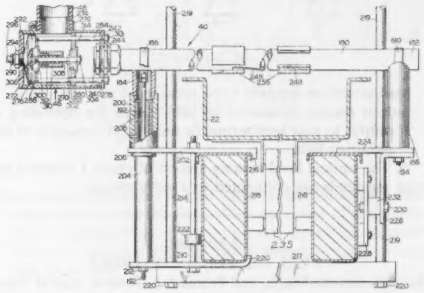
the operative arm normally having no connection with the float and being movable away from the vertical, under the effect of an increase in its buoyancy resulting from an increase in oil level above said height, into a position in which it engages the float and applies an upward force thereto.

3,882,889

FLOW CONTROLLING SYSTEM

Kenneth M. Allen, and Chester H. Harper, both of Newberg, Oreg., assignors to Allen-Harper, Inc., Newberg, Oreg.

Division of Ser. No. 146,299, May 24, 1971, which is a division of Ser. No. 23,093, April 6, 1970, abandoned, which is a continuation of Ser. No. 713,932, March 18, 1968, abandoned.
This application Feb. 19, 1974, Ser. No. 443,423
Int. Cl. F16k 51/00
U.S. Cl. 137—454.2 4 Claims



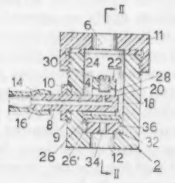
1. In a valve device,
a cylindrical housing having an inlet at one side thereof and having an outlet end and a second end,
a partition disc fitting in the housing and positioned between the outlet end and the inlet end and having an orifice therethrough,
a diaphragm including a housing member positioned in the portion of the housing adjacent the second end thereof, an outlet disc adapted to bear against the outlet end of the housing,
a third disc adapted to bear against the second end of the housing,
connector means connecting the housing member to the third disc,
tie rod means connecting the housing member to the outlet disc to press the outlet disc against the outlet end of the housing,
a valve closure member adapted to close the orifice,
and a valve rod member mounting the closure member and carried by and operable by the diaphragm.

3,882,890

FLUID REGULATING DEVICES

Peretz Rosenberg, Moshav Bet Shearim, Israel

Filed July 5, 1972, Ser. No. 269,256
Claims priority, application Israel, July 9, 1971, 37275; Jan. 7, 1972, 38523; May 24, 1972, 39521
Int. Cl. G05d 16/06
U.S. Cl. 137—505.44 1 Claim



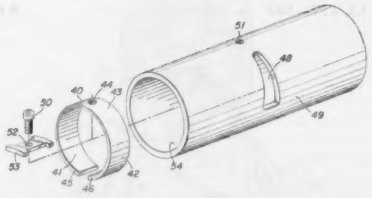
1. A fluid regulating device, comprising: a housing defining a fluid chamber and formed with an inlet opening, an outlet opening, and a vent opening; a tube having an axial passageway for the incoming fluid and an opening extending radially through the wall of the tube in communication with the axial passageway, said tube passing through the housing inlet opening with the radial opening of the tube within the fluid chamber; a regulating ring disposed within the fluid chamber, said regulating ring being formed with an opening of larger cross-sectional area than the outer cross-sectional area of the tube and surrounding the tube in alignment with the radial opening thereof; and a resilient gasket mounted over the housing vent opening and having an opening aligned therewith, the inner face of the gasket contacting a face of the regulating ring, the latter face being formed with a recess aligned with the vent opening and circumscribed by a peripheral projection sealing the housing chamber with respect to the vent opening, whereby changes in the pressure at the inlet opening tending to produce changes in the fluid pressure within the housing chamber cause the resilient member to deform and the regulating ring to move towards and away from the radial opening of the tube in a radial direction with respect to the tube to regulate the flow of the fluid therethrough into the housing fluid chamber and thereby to regulate the pressure therein.

3,882,891

CHECK VALVE

Alan H Viles, and Gary C. Smith, Jr., both of Columbus, Ohio, assignors to Abex Corporation, New York, N.Y.

Filed June 19, 1974, Ser. No. 480,795
Int. Cl. F16k 15/14
U.S. Cl. 137—512.15 1 Claim



1. In a check valve for a cylindrical fluid conductor having a pair of radial ports formed in the fluid conductor; the improvement comprising a resilient partially cylindrical member having a pair of legs joined by a common area and biased against a surface of the conductor to close the ports against fluid flow in one direction but responsive to pressurized fluid in the ports to move away from the fluid conductor to open the ports to enable fluid flow therethrough in the other direction; the resilient member biased against the inner surface of the fluid conductor; means for retaining the resilient member against the inner surface, whereby the pressurized fluid in the ports biases both legs inwardly to open both ports and enable fluid to flow into the fluid conductor; the thickness of each leg increases from the common area to its outer end, each port is tapered such that a larger area is covered by the outer end of a leg and the pressurized fluid in the ports causes the legs to bend mainly at the common area such that the outer ends of the legs will move a greater distance from the inner surface to allow greater fluid flow through the larger port area.

3,882,892

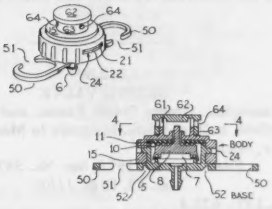
BUTTON DRIP FEED DEVICE

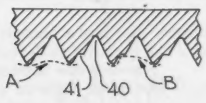
Stanley W. O. Menzel, Elizabeth, Australia, assignor to Iplex Plastic Industries Pty. Ltd., Elizabeth, Australia

Filed Feb. 6, 1974, Ser. No. 439,903
Claims priority, application Australia, Feb. 14, 1973, 2251/73
Int. Cl. B05b 1/32
U.S. Cl. 137—513.3 11 Claims

1. A button drip feed device comprising a body having within it a hollow, an outlet from the hollow of said body, a base engageable on said body to seal said body and close said

hollow, an inlet nipple on said base communicating with the hollow within said body to allow water to be fed into said hollow when said nipple is engaged through an aperture in a supply line, means to hold said base to said supply line comprising an upstanding annular wall on said base coaxial with the said inlet nipple and arranged to project into the hollow of the said body, lugs on the said upstanding wall projecting outwardly therefrom, platforms on the said body to receive said lugs when said lugs are moved through spaces between





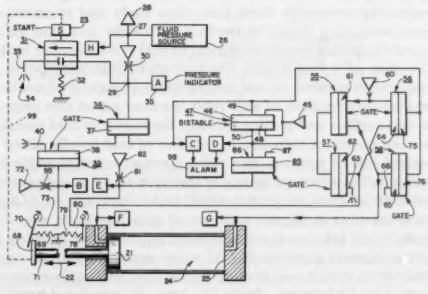
said platforms and the said base is rotated relative to the said body to position the lugs on said platforms to lock the said base to said body, sealing means between said upstanding annular wall and said body, flow control means within said hollow regulating flow from said hollow to said outlet from the hollow, said flow control means comprising a resilient pad and an associated elongated groove defined between said pad and a contiguous face and having one end communicating with said hollow and the other end communicating with said outlet, and means to maintain the said pad and face in contact.

3,882,893

FLUID OPERABLE BINARY CONTROL SYSTEM WITH DIAGNOSTIC INDICATORS

Charles William Brouwer, East Greenwich, and Larry Clyde Cowan, Saunderstown, both of R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Apr. 9, 1973, Ser. No. 349,634
Int. Cl. F01k *13/02*; **F16k** *37/00*
U.S. Cl. 137—557 **24 Claims**



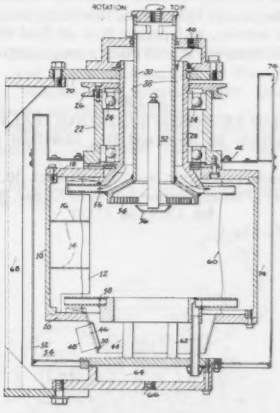
11. A digital fluid operable control system for automatically cycling through a series of control steps of an operation cycle, comprising in combination, means providing fluid at two different pressures, a plurality of logical elements responsive to control pulses of fluid flow therethrough changing between said two pressures to attain a specified state in response to said control pulses, a flow network connecting said logical elements to said means providing fluid to establish at least one controllable flow path through a plurality of the elements, control means responsive to said control pulses of said fluid at predetermined control positions influencing the state of selected ones of said logic elements, a sequence control network responsive to said control means interconnecting said logical elements to cause changes of state of one element to produce a control pulse for another element thereby to produce an automatic control sequence cycle controlling the flow of fluid through said flow path and trigger means coupled to said fluid means to produce a temporary change between said two pressures providing a control pulse at a single one of said elements thereby to effect said control sequence in response to a single trigger input control pulse at one element, wherein a plurality of said logic elements have connected thereto indicators identifying the one of said two pressure conditions established at a flow path controlled by said logic element, including means identifying an invalid combination of pressures at said indicators and the nature of system malfunctions establishing the invalid combination.

3,882,894

DIRECT FIRED WATER HEATER

Lothar A. Huettner, c/o International Continental Corporation, 193 W. Boylston, Boylston, Mass. 01583

Division of Ser. No. 228,290, Feb. 22, 1972, Pat. No. 3,786,798. This application Oct. 11, 1973, Ser. No. 405,540
Int. Cl. F24h *1/10*
U.S. Cl. 137—581 **4 Claims**



1. A liquid receptacle comprising a rotary cylindrical drum, said drum comprising a wall, closures for the drum at each end of the wall, means to rotate the drum, an inlet stator in the drum between the axis of the drum and the wall thereof, an outlet stator in the drum between the axis of the drum and the same wall thereof, the stators being open at their peripheries to provide for flow of liquid therethrough; the outlet stator periphery being closer to the wall than the inlet stator, the rotation of the drum causing liquid in the drum to form a ring along the drum wall, the stators being normally submerged at their outer peripheries within the ring of liquid, the stators each comprise a pair of spaced annular flat plates located in generally transverse planes relative to the axis of the drum.

3,882,895
PROGRAM-CARRIER FOR USE IN FLUID-OPERATED PROGRAMMING SYSTEMS

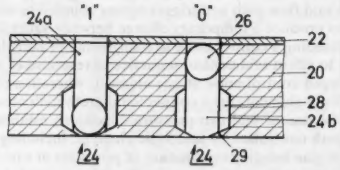
Hans-Heinrich Glattli, Kusnacht, Switzerland, and Walter Klink, Schmiden, Germany, assignors to Pneumotech AG, Fallanden, Switzerland

Filed Mar. 26, 1973, Ser. No. 345,206

Claims priority, application Germany, Mar. 30, 1972, 2215672; Mar. 9, 1973, 2311768

Int. Cl. G11b *23/00, 25/04*

U.S. Cl. 137—594 **10 Claims**



1. An information storage carrier for use in fluid-operated programming systems, comprising a plurality of blocking elements, an essentially two dimensional carrier member, at least one of said carrier member and blocking elements being at least in part from elastomeric material, said carrier member being provided with a plurality of fluid passages configured for accommodating respective ones of said blocking element, each of said fluid passages comprising two axially adjacent passage sections, one of said passage sections having a cross-section slightly smaller than and the other of said passage sections having a cross-section larger than the cross-section of an associated blocking element, so that the blocking element will block the passage against fluid flow when received in said one passage section, and permit flow of fluid through said passage when received in said other passage section.

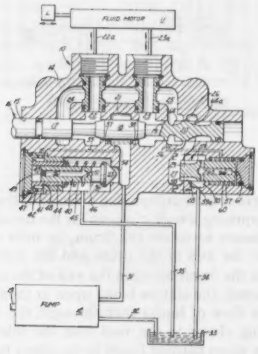
3,882,896
LOAD RESPONSIVE CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 185,146, Sept. 30, 1971, Pat. No. 3,744,517. This application July 6, 1973, Ser. No. 377,044

Int. Cl. F16k *11/00*

U.S. Cl. 137—596.1 **27 Claims**



1. A valve assembly comprising a housing having a fluid inlet chamber, a fluid load chamber, a fluid outlet chamber and fluid exhaust means, first valve means for selectively interconnecting said load chamber with said inlet chamber and said outlet chamber, variable orifice means between said outlet chamber and said exhaust means and responsive to movement of said first valve means, and second valve means disposed to throttle fluid between said outlet chamber and said exhaust means and means to operate said second valve means to maintain a constant pressure difference across said variable orifice means when said load chamber and said outlet chamber are interconnected and said outlet chamber is pressurized.

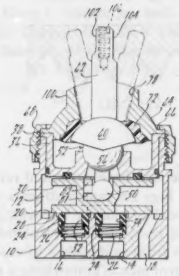
3,882,897
MIXING VALVE

Alex Manoogian, Groose Pointe Farms, and Eric V. Pullen, Southfield, both of Mich., assignors to Masco Corporation, Taylor, Mich.

Filed Aug. 13, 1973, Ser. No. 387,786

Int. Cl. F16k *11/06*

U.S. Cl. 137—625.4 **19 Claims**

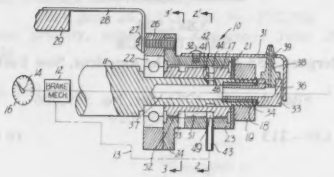


1. A hot and cold water mixing valve comprising a valve body having a mixing chamber therein, one wall of which has a hot water inlet port and a cold water inlet port therein, an outlet port opening from said mixing chamber, a valve member in said mixing chamber having a surface thereof seated against said one wall of said mixing chamber, porting means in said valve member to communicate said inlet ports with said outlet ports, said porting means in said valve member extending over said surface in a generally circular pattern extending through substantially in excess of 180° but less than 360°, operating means for said valve member including a handle projecting outwardly from said valve body and mechanical interconnecting means between said handle and said valve member causing linear movement of said valve member in the direction of a line joining the centers of said inlet ports in response to rotation of said handle about a first axis of rotation and causing rotation of said valve member on an axis normal to said surface and passing through the center of said circular porting means in response to rotation of said handle about a second axis of rotation, said valve member being movable by said handle and interconnecting means in said linear direction between a closed position in which said axis of rotation of said valve member is aligned with one of said inlet ports whereby both of said inlet ports remain closed by said valve member in any rotational position of said valve member, and an open position in which said porting means intersects either one or both of said inlet ports, depending upon the rotational position of said valve member, rotation of said valve member on its axis of rotation when in said open position varying the extent of opening of said inlet ports to regulate the temperature of the mixture discharged through said outlet port.

3,882,898
ROTARY VALVE FOR A POSITION SENSING

Jack Lamar Pickle, Jr., El Paso, Tex., assignor to Farah Manufacturing Company, Inc., El Paso, Tex.

Filed Aug. 23, 1973, Ser. No. 390,855
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.24 **5 Claims**



1. A rotary valve comprising:

A. a cylindrical body with an axial channel therethrough, said body having a cylindrical wall;

B. a pneumatic coupling extending into one end of said channel, said body being rotatable with respect to said coupling;

C. a second channel in said body extending from said axial channel through an arcuately and axially limited section of the cylindrical wall thereof;

D. a housing having a cylindrical recess to receive said cylindrical body;

E. low-friction bearing means supporting said housing from said body to permit free relative rotation between said body and said housing;

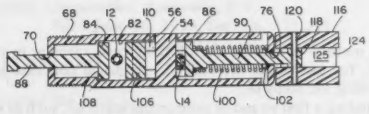
F. a housing channel through said housing extending through the cylindrical wall of said recess to communicate with the second channel; and

G. a groove in the outer surface of said cylindrical wall extending part of the way around said body in an annular direction and communicating with said second channel to permit pneumatic fluid to pass through said coupling, said axial channel, said second channel, and said housing channel over a limited range of relative rotation at least substantially equal to the included arc of said groove.

3,882,899
PINCH VALVE CONSTRUCTION

Guenter Ginsberg, Miami; Thomas John Godin, Hollywood, and Ronald Olin Simpson, Miami, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed July 26, 1973, Ser. No. 382,741
Int. Cl. F16k *11/14*
U.S. Cl. 137—627.5 **9 Claims**

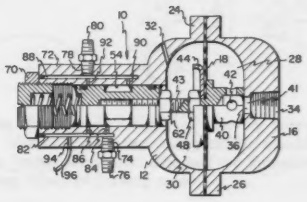


1. A pinch valve of the make-before-break type operable upon at least a pair of flexible conduits each capable of carrying a liquid, said pinch valve comprising: a valve shell having side and end walls, first and second pistons linearly movable sequentially therein and a stop member on said shell interposed between said first and second pistons, said shell having window means in opposite side walls thereof and said flexible conduits being threaded through said window means between said pistons, actuating means coupled to said first piston for moving same in a first direction and biasing means coupled to said second piston for urging the second piston in a direction opposed to said first direction, said first piston being linearly drivable toward said second piston, first to change the condition of one of said flexible conduits while maintaining the condition of the other of said flexible conduits, thereafter continuing linear movement in the first direction to overcome the biasing means and changing the condition of the other of said flexible conduits.

3,882,900
PRESSURE SENSING AND RESPONDING DEVICE

Horace A. Williams, 6123 Rodeo Ln., Salt Lake City, Utah 84121

Filed June 4, 1973, Ser. No. 366,450
Int. Cl. F16k *11/07*, *51/00*
U.S. Cl. 137—625.34 **12 Claims**

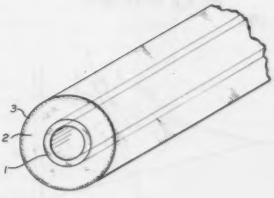


1. A pressure sensing valve comprising a valve housing, a pressure sensing means carried within said housing, a porous valve means responsive to said pressure sensing means and a series of ports connected to fluid carrying passageways bored within said housing, said ports being exposed or covered by said valve means as pressure changes are sensed by said pressure sensing sending means.

3,882,901
TUBULAR QUARTZ GLASS BODY

Karl Seiler, and Karlheinz Rau, both of Hanau am Main, Germany, assignors to Heraeus-Schott Quarzschmelze GmbH, Hanau am Main, Germany

Filed July 30, 1973, Ser. No. 384,329
Claims priority, application Germany, Aug. 5, 1972, 7229058[U]
Int. Cl. F16l *9/14*, *9/10*; B32b *17/06*
U.S. Cl. 138—141 **3 Claims**



1. Diffusion tube comprising an inner tubular portion of high-purity synthetic quartz glass fused to a surrounding portion of quartz glass, said inner portion having a wall thickness of at least 0.05 mm, said surrounding portion consisting of a quartz glass manufactured by fusion of quartz crystals in granular or powder form and having an outer layer of finely crystalline cristobalite or in the outer surface layer thereof crystallization promoting nuclei capable of forming an outer layer of crystalline silica, said nuclei having a rate of diffusion in quartz glass less than that of sodium at elevated temperatures, and said surrounding portion having a wall thickness amounting to at least 50% of the total wall thickness of the diffusion tube.

3,882,902

ADJUSTABLE SLEY SWORD PIVOTING BEARING

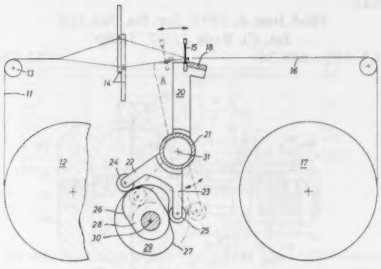
Erhard Freisler, Bubikon, and Karl Jud, Ruti, Zunich, both of Switzerland, assignors to Ruti Machinery Works Ltd., Ruti/ZH, Switzerland

Filed Sept. 17, 1973, Ser. No. 398,079

Claims priority, application Switzerland, Sept. 19, 1972, 13663/72

Int. Cl. D03d *49/60*

U.S. Cl. 139—190 **5 Claims**



1. Loom having a sley carried by sley swords, wherein each sley sword is operatively connected to two drive arms each carrying a cam roller at its free end, each of said cam rollers traveling on the face of a cam disc so as to impart to the sley a continuous pivoting movement which takes place about a first shaft, characterized in that the said first shaft is carried for rotation by a second shaft and is arranged eccentrically relative to said second shaft, in that the said second shaft is rotational and is carried by a third shaft and is arranged eccentrically relative to said third shaft, and in that said third shaft is attached for rotation in stationary bearings positioned in the frame of said loom.

3,882,903

DEVICE ADAPTABLE TO THE REED OF A WEAVING LOOM

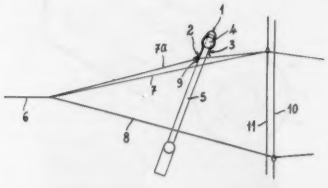
Albert Deborde, 13, Rue Belle Rine, Bourgoin-Jallieu, France

Filed May 21, 1973, Ser. No. 362,077

Claims priority, application France, June 16, 1972, 72.22470

Int. Cl. D03d *49/62*

U.S. Cl. 139—192 **4 Claims**



1. A device for use with the reed of a loom, the reed having an upper binding with depending teeth, the device being adapted to be fitted on the upper binding of the reed, said device comprising a body of inverted trough section having a central portion and downwardly extending opposite wings, said body being made of a material of adequate rigidity but having nevertheless an elasticity sufficient to permit fitting of the body on the reed binding by simple clipping action so that the wings straddle the reed on opposite sides thereof, at least one of said wings including a lower rounded portion which is outflared in a direction away from the central portion in such a position as to extend tangentially to warp threads of the upper sheet passing through the reed and at a level substantially below the upper binding and adjacent the teeth of the reed to constitute a barrier to stop a knot in a warp thread in upward movement thereof at a level adjacent the teeth whereat the teeth can spread and permit passage of the knot therebetween without damage to the thread.

3,882,904

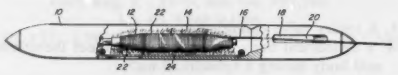
SHUTTLE FUR

Isidore Bergner, 855 Avenue of the Americas, New York, N.Y. 10001

Filed Aug. 16, 1973, Ser. No. 389,006

Int. Cl. D03j *5/24*

U.S. Cl. 139—213 **10 Claims**



1. Improved shuttle fur comprising a relatively thin longitudinal strip of natural animal or synthetic fur having fur fibers connected to the animal skin or a base sheet and means stitching said fibers to said skin or base sheet along at least one longitudinal edge of said strip, which means acts on the base of the stitched fur fibers to force the base of said stitched fur fibers toward the longitudinal center of said strip and to urge said stitched fur fibers against their natural tendency to bend over the edge away from the longitudinal center of said strip to thereby increase the fur density of said fur fibers.

3,882,905

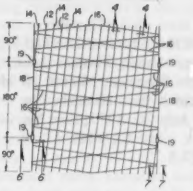
REINFORCING CAGE

Kenneth E. James, Denver, Colo., assignor to Stressed Pipe Research, Inc., Englewood, Colo.

Division of Ser. No. 340,019, March 12, 1973, Pat. No. 3,841,356. This application July 29, 1974, Ser. No. 492,424

Int. Cl. B21f *3/04, 15/04, 27/02*

U.S. Cl. 140—92.1 **5 Claims**



1. A method of making a reinforcing cage, circular in cross section, for use within the wall of cylindrical concrete pipe, comprising the steps of:

a. winding a first strand of reinforcing material, such as steel wire or rod, around a circular mandrel to form a first coil axially spaced convolutions;

b. disposing longitudinally extending pairs of like strands on top of the first coil at angular positions therearound and in a configuration such that each pair forms right and left hand helices;

c. winding a second like strand to form a second coil, the convolutions of which are disposed between the convolutions of the first coil, the winding being under sufficient tension to distort the longitudinally extending strands at their points of crossing with both coils into a generally sinusoidal form having valleys therealong, the valleys forming locks to maintain the two coils in axially spaced relationship; and

d. securing the ends of the two coils together to form an end ring at each end of the cage.

3,882,906

WIRE WINDING MACHINE

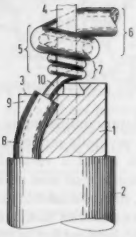
Ewald Steiner, Allmannshausen, and Hans Scholtholt, Munich-Lohhof, both of Germany, assignors to Siemens Aktiengesellschaft, Postfach 261, Germany

Filed June 26, 1973, Ser. No. 373,736

Claims priority, application Germany, June 30, 1972, 2232246

Int. Cl. B21f *15/00*

U.S. Cl. 140—124 **17 Claims**



1. A wire winding machine for connecting insulated jumper wires to contact pins by means of a winding spindle rotatable in a sleeve about a winding axis, said winding spindle including a wire guiding channel running toward a frontal surface of said spindle, said channel including a first portion terminating in an end surface lying at an angle with said frontal surface of said spindle and forming a wedge-shaped intersection with the frontal surface of said winding spindle to form first cutting edges for stripping the insulation from said wire, said wire guiding channel further including a U-shaped recess extending from said end surface to said frontal surface, the core of said wire issuing from said recess to be connected to said pin, the boundary of said U-shaped recess (**21, 32, 44**) having at least a cutting edge formed by the intersection of said boundary with a surface (**26, 41, 47**) inclined with respect to said frontal surface, said recess cutting edges meeting said first cutting edges (**20, 23**) substantially at right angles, said first cutting edges and said recess cutting edges being disposed inwardly from the wire guiding channel toward the winding axis of the spindle.

3,882,907

TWISTED CONDUCTOR FABRICATION

Donald S. Degen, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed June 18, 1973, Ser. No. 371,311

Int. Cl. B21f *7/00*

U.S. Cl. 140—149 **3 Claims**

1. In a method of forming a pair of twisted conductors comprising the steps of:

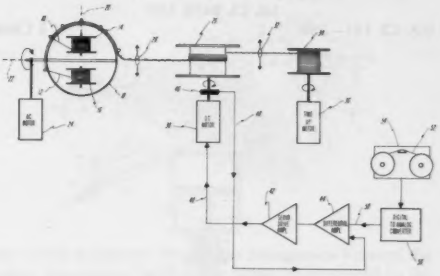
drawing the conductors through a twisting mechanism under the control of a drawing mechanism operating at a first speed, which is dependent upon the magnitudes of signals applied to an input of the drawing mechanism and being arranged to draw the wires at the first speed;

operating the twisting mechanism at a second speed, which is substantially constant, to twist the conductors around each other;

successively providing individual values of drawing speed selected at random from a set of unique and permissible drawing speeds;

converting the selected individual values of drawing speed to signals which are representative of the selected individual values, and

applying the signals representative of the successively provided values to the input, the improvement comprising the step of:



providing the individual values of drawing speed so that each value of drawing speed is other than an odd multiple of the immediately preceding and the immediately succeeding values of drawing speed.

3,882,908

CENTRIFUGAL MACHINE FOR FILLING OF POWDER CAPSULES

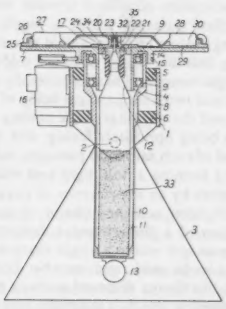
Sten Henrik Danieli, and Arne Sundstrand, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 3, 1973, Ser. No. 420,921

Claims priority, application Sweden, Dec. 5, 1972, 15815/72

Int. Cl. B65b *1/14;* **B22f** *3/06;* **B33d** *13/00*

U.S. Cl. 141—34 **3 Claims**



1. A centrifugal machine for filling powder into capsules having an annular forming space for forming a powder body which is to be converted into a solid body with high density by pressing at high temperature, comprising a frame, a rotatable unit rotatably carried by the frame, means for fixing a capsule upon said unit, means for driving said unit, a replaceable powder receptacle, a holder carried by said frame for holding said receptacle stationarily with respect to the frame, and an elastomeric sleeve into which one end of the receptacle is inserted forming a substantially gas-tight a connection between said receptacle and a capsule fixed upon the rotatable unit for transferring powder from the receptacle to the capsule.

3,882,909

TRANS-A-JET 1

Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, South El Monte, Calif.

Filed July 5, 1973, Ser. No. 376,587
Int. Cl. B65b *3/04*
U.S. Cl. 141—286 1 Claim

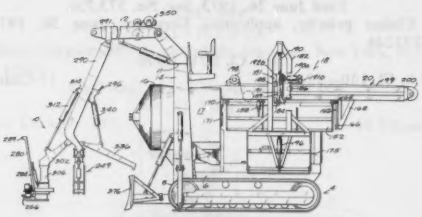
1. The combination of a fluid transfer device comprising two parallel fluid passages within a single elongated rigid member having cutting ends, said rigid member being carried by a generally disk-like flange disposed midway between the ends of said rigid member which is generally perpendicular to said passages, said two fluid passages being of equal length and coterminous, and the openings at the cutting ends of adjacent fluid passages being oppositely facing, and a common cover for the one end of each said fluid passages, said cover abutting said flange and forming a fluid tight seal with the exterior of said rigid member by an interference or press fit between the interior of said cover and the exterior of said rigid member, the combination of a fluid transfer device comprising two parallel fluid passages within a single elongated rigid member having cutting ends, said rigid member being carried by a generally disk-like flange disposed midway between the ends of said rigid member which is generally perpendicular to said passages, said two fluid passages being of equal length and coterminous, and the openings at the cutting ends of adjacent fluid passages being oppositely facing, and a common cover for the one end of each of said fluid passages, said cover abutting said flange and forming a fluid tight seal with the exterior of said rigid member by an interference or press fit between the interior of said cover and the exterior of said rigid member, said cover being provided at the end thereof opposite said flange with an imperforate removable resilient cap which can be pierced by a needle and an adjacent airway provided with air filtration means, and a medicament container having an open end, an imperforate rubber stopper in said open end which seals said container, the other end of said rigid member piercing said stopper and said flange abutting the exterior of said stopper, and said cover sealing the interior of said container against contamination.

3,882,910

TIMBER HARVESTER

Waino Peltola, Rt. 1, Tripoli, Wis. 54564, and Ervin W. Braski, Brantwood, Wis. 54513

Division of Ser. No. 57,281, July 22, 1970. This application Aug. 7, 1972, Ser. No. 278,333
Int. Cl. A01g *23/08*
U.S. Cl. 144—3 D 1 Claim



1. A timber harvester comprising in unitary assembly a main frame, a sub-frame pivotally mounted on said main frame for swinging movement about a vertical axis, a forward boom pivotally mounted on one of said main frame and sub-frame, a grapple assembly, means mounting said grapple assembly on said main boom, a saw carrier frame, means for mounting said carrier frame on said forward boom to afford vertical swinging movement of said carrier frame about a first horizontal axis, means for mounting said carrier frame to said forward boom for vertical swinging movement about a second horizontal axis, means for turning said carrier frame about a generally vertical axis, a saw bracket, a cutter bar mounted on said saw bracket, a cutter chain carried by said cutter bar, a motor mounted on said saw bracket, said motor having an output shaft in driving engagement with said saw chain, means for mounting said saw bracket on said carrier frame to afford movement of said cutter bar in a linear cutting path, a guide member resiliently and elastomerically mounted on and cantilevered from said carrier frame and extending from said carrier frame and a sleeve on said saw bracket reciprocable on said guide member to guide linear movement of said cutter bar, a spike bar mounted on said carrier frame adapted to engage a tree trunk, a delimber mounted on said sub-frame, feed means adapted to withdraw timber through said delimber, said feed means being located aft of said delimber, a log unloading assembly comprising a log receiving chamber located aft of said feed means to receive logs from said feed means, a cut-off saw located between said feed means and said log receiving chamber, means mounting said cut-off saw for movement of said saw into the feed path of logs to cut a log extending through said delimber and into said log receiving chamber, means at the rearward end of said log receiving chamber adapted to engage the butt end of a log moving through said single log receiving chamber and energize said cut-off saw, said log unloading assembly further including a log accumulator bucket, and means mounting said bucket on said sub-frame, said bucket being upwardly open to receive logs discharged from said log receiving chamber.

3,882,911

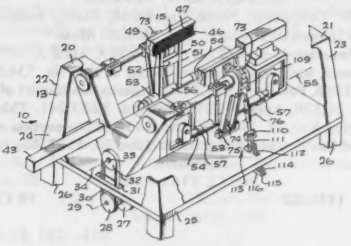
APPARATUS FOR CUTTING PATTERN IN GUN STOCK OR OTHER WORK PIECE

Frank A. Pachmayr, Los Angeles, and Edward B. Miller, Harbor City, both of Calif., assignors to Pachmayr Gun Works, Inc.

Filed June 25, 1971, Ser. No. 156,655
Int. Cl. B44b *5/00*; B27m *3/00*
U.S. Cl. 144—136 J 25 Claims

1. Appartus comprising a cutter structure having cutting edges arranged in a predetermined pattern which is to be essentially reproduced on a work piece, and means for producing relative vibratory movement between said cutter struc-

ture and said work piece, while the cutter structure is positioned for contact with the work piece, and in a relation pregressively cutting said pattern on the work piece, said means including a hammer positioned to apply a series of



successive hammer blows to said cutter structure and thereby cause vibration thereof, and a wheel having a series of actuating elements operable upon rotation to actuate said hammer to apply said hammer blows to the cutter structure.

3,882,912

CUTTER FOR WOOD CHIPPER HAVING RADIALLY OFFSET BLADES

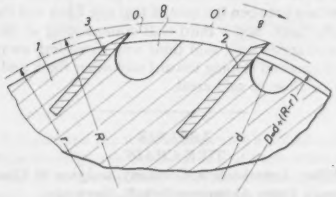
Hans Sybertz, Hargesheim, Germany, assignor to Hombak Maschinenfabrik KG, Bad Kreuznach, Germany

Filed Aug. 24, 1973, Ser. No. 391,159

Claims priority, application Germany, Aug. 25, 1972, 2241938

Int. Cl. B27c *1/00*

U.S. Cl. 144—172 **3 Claims**



1. A cutter for a wood-chipping apparatus, said cutter comprising an arbor rotatable about an axis, at least one first blade secured to said arbor and having an edge projecting from said arbor and defining on rotation thereof an inner orbit, and at least one second blade secured to said arbor and having a plurality of axially spaced and aligned outer edges projecting from said arbor and defining on rotation thereof an outer orbit radially outside said inner orbit, said arbor having relative to the rotation direction thereof a diameter in front of said second blade equal to the diameter in back of the second blade plus the radial distance between said inner and outer orbits.

3,882,913

METHOD FOR DELIMBING FELLED TREES

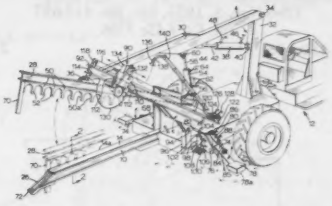
Benoit L. Morin, Hornepayne, Ontario, Canada, assignor to Morard Pulpwood Company Limited, Hornepayne, Ontario, Canada

Division of Ser. No. 259,013, June 2, 1972, Pat. No. 3,805,858. This application Mar. 4, 1974, Ser. No. 447,776

Int. Cl. A01g *23/00*

U.S. Cl. 144—309 AC **4 Claims**

1. A method of delimbing felled trees, comprising locating a plurality of trunks of felled trees transversely of a first beam, lowering a second beam towards the first beam to spread the trunks over the first beam and form between the beams a plurality of side by side passageways having peripheral cutting edges around different ones of the trunks, and then moving



said trunks lengthwise through the passageways between the beams thus causing limbs on the trunks to be severed by the cutting edges.

3,882,914

CARRYING STRAP CONSTRUCTION

Glenn L. Strutz, Madras, Oreg., assignor to Tote Pak Co., Madras, Oreg.

Filed July 16, 1973, Ser. No. 379,716

Int. Cl. A63b *55/00*

U.S. Cl. 150—1.5 R **6 Claims**

5. A carrying strap construction comprising:

a first thin, soft, pliable strip forming a first surface layer of said strap;

a second thin, soft, pliable strip overlying said first strip and forming a second surface layer of said strap;

a thin, flexible strip of high-strength material resistant to stretching forming an inner load-bearing layer of said strap between said first and second surface layers;

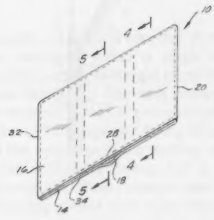
at least one end portion of said strap including said first and second surface layers and said inner layer being fastened to a carrying bag by attachment means comprising at least two side-by-side rivets, extending through said surface layers and said load-bearing inner layer and through the material of said bag and through a backing patch member on an inside surface portion of said bag material with said rivets compressing the aforesaid layers of said strap and bag between the opposite enlarged ends of said rivets;

and cross-stitching extending across the width of said strap end portion and through said surface and inner layers of said strap and through said bag material and said backing member at a position on said strap spaced toward the end of said strap from said rivets.

3,882,915
PROTECTIVE DEVICE FOR WALLETS, PURSES AND THE LIKE
Anna M. Filipski, and Roman F. Filipski, 2835 N. Damen, Chicago, Ill. 60618
Filed Nov. 5, 1973, Ser. No. 412,697
Int. Cl. A45c *1/06*
U.S. Cl. 150—35 2 Claims

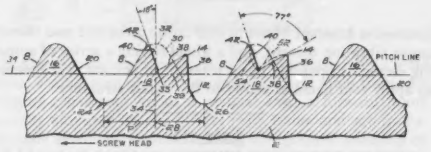
1. In combination:
a foldable wallet; and
a rectangular steel compression spring constituted by a plurality of brightly colored like square sections secured end to end and foldable side by side, one upon the other, said spring being normally disposed in folded state within the folded wallet, said spring, when the wallet is unfolded, automatically unfolding into a rectangular strip, one end of the strip being secured to the wallet.

3,882,916
BILLFOLD
Joseph Margolis, 500 E. 85th St., New York, N.Y. 10028
Filed Feb. 7, 1974, Ser. No. 440,530
Int. Cl. A45c *1/06*
U.S. Cl. 150—38 8 Claims



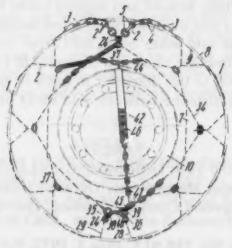
1. A natural fold billfold comprising:
a substantially rectangular panel having a longitudinal length and a lateral width,
said panel having a lateral fold line, said fold line separating a first substantially rectangular subpanel and a second substantially rectangular subpanel, the longitudinal distance of said second subpanel being greater than the longitudinal distance of said first subpanel,
the lateral edge of said first subpanel most removed from said fold line and the lateral edge of said second subpanel most removed from said fold line being joined to each other providing a joined edge,
a longitudinal edge of said first subpanel being joined to the corresponding longitudinal edge of said second subpanel along a first distance extending less than halfway from said joined edge to said fold line and along a second distance extending less than halfway from said fold line to said joined edge, at least one unjoined distance inwards of said first and second distances being sufficient to accommodate and define at least one belly zone for said second and longer subpanel providing at least one natural fold when said second subpanel is folded as the outer surface of a billfold.

3,882,917
SELF-LOCKING THREAD
Roger W. Orlomoski, North Brookfield, Mass., assignor to Litton Industrial Products, Inc., Holden, Mass.
Continuation-in-part of Ser. No. 26,529, April 3, 1970, abandoned, and a continuation-in-part of Ser. No. 734,833, May 3, 1968, Pat. No. 3,517,717, Continuation-in-part of Ser. No. 26,520, April 3, 1970, Pat. No. 3,653,241. This application Apr. 14, 1972, Ser. No. 243,932The portion of the term of this patent subsequent to June 30, 1987, has been disclaimed.
Int. Cl. F16b *39/30*
U.S. Cl. 151—22 18 Claims



1. A self-locking thread characterized by a massive rib on one flank only of the thread, said rib having an outer wall commencing at the said one flank along an arcuate line intermediate the pitch line and root of said thread, said rib having an inner wall commencing nearer to the intersection of said pitch line and transverse mid-section of said thread than to the original line of said one flank, said outer and inner walls intersecting along an arcuate line substantially outside of the normal flank of said thread which line is generally midway in an axial direction between the root of said one flank and the crest of said one flank, and a third wall commencing at the inner edge of said inner wall, said third wall extending away from the thread axis and sloping toward said other flank and terminating at or close to said crest.

3,882,918
TIRE CHAIN
Anton Müller, Unterkochen, Germany, assignor to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Germany
Filed Nov. 2, 1973, Ser. No. 412,497
Claims priority, application Germany, Nov. 3, 1972, 2253813
Int. Cl. B60c *27/12*, *27/06*
U.S. Cl. 152—213 R 27 Claims



1. In combination with an anti-skid chain for a tire, said chain having a running part for resting on the tire tread and inner and outer annular marginal portions having spaced points connected to opposite side edges of the running part and disposed at opposite sides of the tire when the chain is mounted thereon including reaching behind the tire during

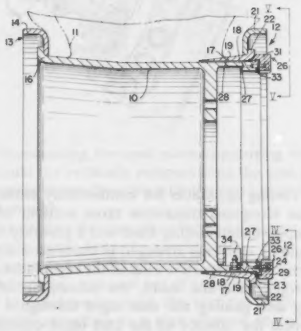
chain assembly therewith, the inner one of said marginal portions including separable connector means, the outer one of said marginal portions being flexible in the radial direction of the tire, and a bar member for holding and pulling use in assembling the chain on a tire and adapted to extend diametrically of the tire, and means for securing the said bar member to the chain in structurally operative condition when disposed diametrically of said tire including a flexible strand movably linked to said outer marginal portion.

3,882,919

SAFETY RIM

Charles C. Sons, Jr., Peoria, and Danny L. Johnston, Morton, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Dec. 13, 1973, Ser. No. 418,401
Int. Cl. B60c *5/00*
U.S. Cl. 152—410 **9 Claims**



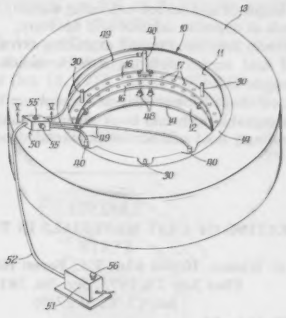
1. A pneumatic tire wheel comprising a cylindrical rim base, said base having a rim at one axial end thereof for supporting one side of a tire on said base and including a safety rim assembly at the other axial end thereof for supporting the other side of the tire on said base and for preventing hazardous dislodgement of the components of said assembly during tire inflation and disassembly, said safety rim assembly including support means for supporting the tire on said base, said support means including a bead seat band annularly disposed around the outer periphery of said rim base having a bead seat for sealing engagement with the tire, and an annular flange disposed against an outer peripheral lip of said bead seat band so that inflation of the tire presses said flange against said lip, locking means including a lock ring seated in an annular groove formed in the outer periphery of said rim base and disposed against said bead seat band so that said support means are locked in position during tire inflation, and retaining means for retaining said lock ring in said groove including a retainer block removably securable to said rim base adjacent said lock ring, said lock ring and said block having their adjacent surfaces in substantially mating relationship so that improper seating of said lock ring in said groove prevents proper installation of said retainer block, passage means communicating between the atmosphere and the rim base intermediate said rim and said safety rim assembly and sealing means for sealingly closing said passage means during functioning of said locking means to lock said support means, thereby permitting inflation of the tire, and wherein improper seating of said lock ring in said groove prevents said sealing means from sealingly closing said passage means.

3,882,920

TUBE-TIRE AND RIM MOUNTING TOOL

Dwaine Ralph Barnes, Peoria, and John Frederick Lindquist, Morton, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Nov. 19, 1973, Ser. No. 416,952
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.1 **5 Claims**



1. A tube-tire rim mounting tool for parallel closure of split rim halves used with tube-tires comprising:

a plurality of ram pullers, each having a ram and a cylinder with a connected cross head means;

pull rods connected to each cross head means operable to mechanically connect said cross head when it is adjacent to one rim flange to a rim flange remote from said cross head;

a control unit connected through separate connections to each of said cylinders, said control unit including separate control means operable to independently control each of said cylinders; and

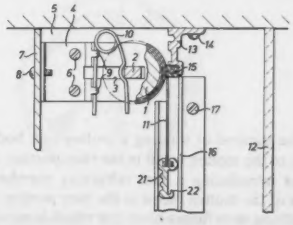
a source of power for said cylinders connected to said control unit whereby said separate control means can be independently employed to control the several said rams in a manner that several rim flanges of a split rim to which the ram pullers are attached can be closed while maintaining a substantially parallel relationship.

3,882,921

ROLLER SCREEN ASSEMBLY FOR AN APERTURE

Ronald Ernest Sandall, Aylesbury, England, assignor to Beauty Blinds Limited, Winslow, England

Filed July 30, 1973, Ser. No. 383,477
Claims priority, application United Kingdom, Aug. 4, 1972, 36521/72
Int. Cl. E06b *9/17*
U.S. Cl. 160—266 **2 Claims**



1. A roller screen assembly for an aperture, comprising:

a spring-return roller having a flexible glazing screen wound thereon;

a headboard adjacent said roller, having a sealing member thereon positioned to sealingly engage the outer turn of the screen on said roller;

said roller having coaxial trunnions thereon extending from the ends thereof and into slots at opposite sides of said aperture;

resilient means urging said trunnions and roller along said slots toward said sealing means to maintain said screen in contact with said sealing means;

the edges of said screen extending slidably into guide channels at opposite sides of said aperture;

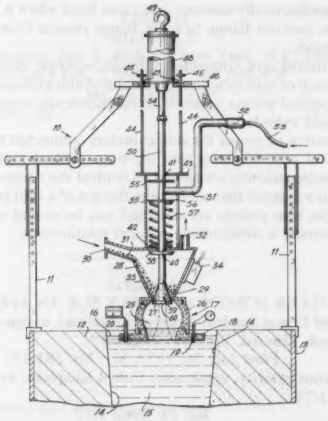
a bottom strip fixed to and extending across the lower edge of said screen defining a hook means throughout its length; and

a hook shaped lower strip at the bottom of said aperture, engageable with said hook means of said bottom strip to sealingly hold said screen in extended position.

3,882,922
TREATING OF CAST MATERIALS IN THE MOLTEN STATE

Liviu B. Wiener, 105-40 62nd Rd., Forest Hills, N.Y. 11375

Filed July 23, 1973, Ser. No. 381,510
Int. Cl. B22d *27/06*
U.S. Cl. 164—53 **7 Claims**

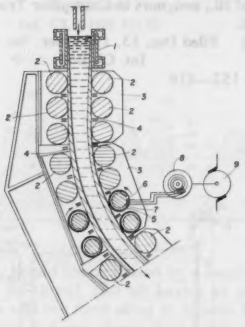


1. The method of treating a molten cast body beneath the surface of the molten metal in the riser portion comprising the steps of introducing a first refractory member beneath the surface of the molten metal in the riser portion of said molten cast body so as to form a chamber which is substantially segregated from the atmosphere, introducing a second refractory member within the confines of said chamber, moving said second refractory member beneath the surface of said molten cast body, and supplying a bubbling gas through said second refractory member.

3,882,923
APPARATUS FOR MAGNETIC STIRRING OF CONTINUOUS CASTINGS

Robert Alberny, Metz, and Jean Delassus, Montmorency, both of France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), St. Germain-en-Laye and Compagnie Electro-Mecanique (CEM), Paris, both of, France

Filed June 4, 1973, Ser. No. 366,592
Claims priority, application France, June 8, 1972, 72.20546; June 8, 1972, 72.20545; May 29, 1973, 73.19399; May 29, 1973, 73.19400
Int. Cl. B22d *11/12*
U.S. Cl. 164—250 **8 Claims**



1. In a casting apparatus for continuously casting a metal ingot of an elongated transverse cross section, which comprises an open-ended casting mold and a plurality of supporting and guiding elements arranged in succession adjacent the mold for engaging respective ones of the ingot faces as the cast ingot emerges from the mold, the succession of elements supporting and guiding the cast ingot through a treatment zone wherein the interior of the cast ingot contains molten metal, the improvement including

1. at least one of the supporting and guiding elements defining an interior cavity,
2. an electrical inductor structure arranged within the cavity, and
3. a source of multi-phase current,
   a. the inductor structure being connected to the current source for generating a mobile magnetic field extending through the supporting and guiding element wherein the inductor structure is arranged into the molten interior of the cast ingot for magnetically stirring the molten metal in the interior while the cast ingot is supported and guided through the treatment zone.

3,882,924
CAST PIECE SUPPORTING APPARATUS FOR A CONTINUOUS CASTING MACHINE

Yasuo Fujikawa, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1973, Ser. No. 419,101
Claims priority, application Japan, Dec. 18, 1972, 47-126183; Oct. 15, 1973, 48-114687
Int. Cl. B22d *11/12*
U.S. Cl. 164—283 R **8 Claims**

1. In apparatus for carrying out a continuous casting process wherein molten metal is continously moulded into a cast piece which is supported and cooled, and is drawn at a selected speed from downstream of where the cast piece is moulded, supported and cooled,

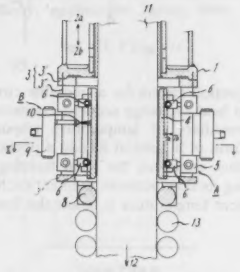
a cast piece supporting apparatus for a continuous casting machine for drawing the cast piece, comprising:

a downwardly opening mould;

means connected to said mold for cyclically vertically raising the mould faster than the selected drawing speed to an upper position and for permitting the mould to descend to a lower position as a cast piece issues downwardly therefrom whereby the mould is vertically reciprocated;

said means connected to said mold including means for regulating the speed of descent of the mould to equalize the speed of descent of the mould with the selected speed of drawing of the cast piece;

cast piece supporting means including plate means engageable with the periphery of the cast piece adjacent where the cast piece issues from the mould;



means co-mounting the cast piece supporting means with the mould for vertically reciprocating the cast piece support means in synchronism with the vertical reciprocation of the mould;

means for cooling the cast piece located adjacent where the cast piece issues from the mould; and

means connected to said plate means for laterally moving the plate means into and out of engagement with the cast piece in synchronism with the vertical reciprocation of the mould according to a plan wherein the plate means are engaged with the cast piece so long as the mould is lowering and are retracted out of contact with the cast piece so long as the mould is being raised.

3,882,925

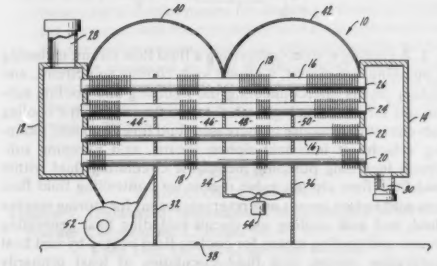
METHOD AND APPARATUS FOR CONDENSING STEAM

Ferdinand V. Huber, Canton, Ohio, assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed June 17, 1974, Ser. No. 479,722

Int. Cl. F28b *1/06*

U.S. Cl. 165—1 **7 Claims**



1. A method for condensing steam in an air cooled steam condenser having a plurality of substantially identical heat exchange tubes arranged in a plurality of generally parallel rows, comprising the steps of: passing steam through each of said tubes at substantially the same flow rate; and passing cooling air across the initial lengths of the heat exchange tubes in one direction and then back across succeeding lengths of the heat exchange tubes in an opposite direction so as to mollify the effects of temperature differential of the cooling air as it passes from one row of tubes to the next.

3,882,926

ROTARY HEAT EXCHANGER, IN PARTICULAR FOR A GAS TURBINE

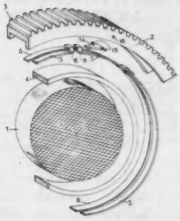
Jack Guillot, Juvisy-sur-Orge, France, assignor to Bennes Marrel, Saint-Etienne (Loire), France

Filed Oct. 15, 1973, Ser. No. 406,419

Claims priority, application France, Oct. 18, 1972, 72.37572

Int. Cl. F28d *19/00*

U.S. Cl. 165—8 **5 Claims**



1. A rotary heat exchanger comprising a disc of porous ceramic material having a uniform circular peripheral surface, an annular layer of deformable refractory material disposed about the periphery of said disc, a plurality of split annular collars disposed about said refractory material in side by side relation, clamping means engaging the ends of said collars for clamping said collars and said refractory material to the periphery of said disc, an annular gear ring surrounding said collars in radially spaced relation thereto and link means pivotally interconnected between said collars and said gearing whereby rotary motion imparted to said gear ring would be transmitted through said link means, said collars and said refractory material to said disc.

3,882,927

SEAL FOR ROTARY REGENERATIVE HEAT EXCHANGER

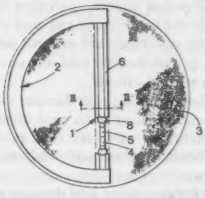
Robert Noel Penny, 12 Alderbrook, Solihull, England

Filed Mar. 27, 1973, Ser. No. 345,272

Claims priority, application United Kingdom, Mar. 28, 1972, 14406/72

Int. Cl. F28d *19/00*

U.S. Cl. 165—9 **6 Claims**



1. A rotary regenerative heat exchanger having a disk-like rotatable matrix and including a pair of seals of which one engages one end face of the matrix and the other engages the other end face of the matrix, at least a portion of one of the seals being formed from a plurality of blocks of which some are made of one material and at least some of the remaining

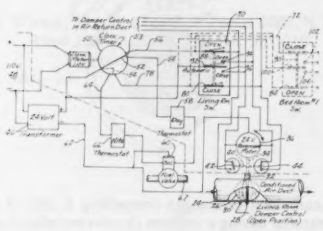
blocks are made of another material having a different coefficient of linear expansion, said blocks arranged end-to-end in a guide housing, adjacent end faces of the blocks being shaped to form a joint permitting articulation of adjacent blocks about a pivotal axis extending transversely of the blocks and parallel with the plane of the end face of the matrix, the blocks being of sufficiently short length and sufficient in number to permit said portion of the seal to conform to the surface profile of the end face of the matrix, and the materials and the lengths of the respective blocks being such that the effective coefficient of linear expansion of the seal is substantially the same as that of the guide housing.

3,882,928

BUILDING HEATING AND COOLING SYSTEM

Joseph F. Gazzo, 1303 McKinley Ave., Des Moines, Iowa 50315

Filed Mar. 1, 1974, Ser. No. 447,380
Int. Cl. F24f *3/00*
U.S. Cl. 165—12 **10 Claims**



1. A building heating and cooling system for providing conditioned air alternately to two zones of the building comprising,

a conditioned air source having an electrical control means movable between open and closed positions,

an output conditioned air duct connected between each zone and said air source,

a damper in each duct having a reversible motor for moving said damper between open and closed positions,

a pair of limit switches alternately opened and closed by said damper as it moves between said open and closed positions,

a thermostat for each zone,

a clock timer connected to an electrical power source and including alternate circuits therethrough for operating said damper motors,

a first circuit for operating said electrical control means including said power source, one timer circuit, a thermostat for one zone and said electrical control means,

a second circuit for operating said electrical control means including said power source, the other timer circuit, the thermostat for the other zone and said electrical control means whereby said electrical control means at times set on said timer is operated by said one circuit and at other times by said second circuit,

a third circuit for operating said damper motors and opening said dampers in one zone and closing them in the other zone including said electrical power source, said one timer circuit, one of said limit switches and said damper motor,

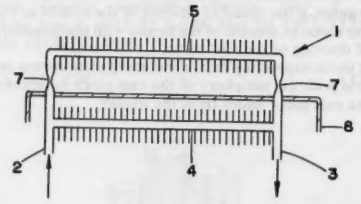
a fourth circuit for operating said damper motors and closing said dampers in one zone and opening them in the other zone including said electrical power source, the other timer circuit, the other of said limit switches and said damper motor whereby at times said conditioned air source supplied conditioned air only to said one zone of said building having dampers open and at other times supplies air only to said other zone having dampers open.

3,882,929

HEAT REJECTION SYSTEM

Lucien Yehuda Bronicki, Rehovoth, Israel, assignor to Ormat Turbines (1965) Ltd., Yavne, Israel

Filed Aug. 16, 1973, Ser. No. 388,862
Int. Cl. B60h *1/00*
U.S. Cl. 165—40 **1 Claim**



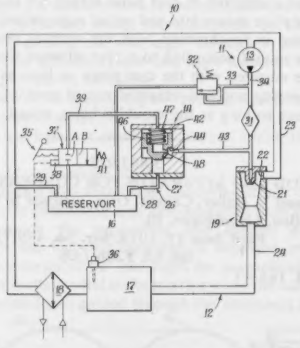
1. A heat rejection system for a freezable circulating fluid, comprising two heat exchange sections connected in parallel with the intermediary of temperature responsive control means in the form of a conduit having a portion of reduced cross-section that enhances the local freezing of the fluid thereby blocking its flow between the heat exchange sections when the ambient temperature is below the freezing point of the fluid.

3,882,930

COOLING SYSTEM FOR BRAKES

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Nov. 1, 1973, Ser. No. 411,776
Int. Cl. F28d *15/00*
U.S. Cl. 165—40 **9 Claims**



1. A cooling system comprising a fluid flow circuit including a pumping sub-circuit, a closed loop cooling sub-circuit, and siphon means interconnecting the pumping and cooling sub-circuits for initiating high-volume fluid flow within the cooling sub-circuit in response to increased fluid flow from said pumping sub-circuit into said siphon means, said pumping sub-circuit including pumping means for circulating fluid within said fluid flow circuit, valve means for controlling fluid flow into said siphon means and reservoir means for storing reserve fluid, and said cooling sub-circuit including heat generating means and cooling means for cooling fluid heated by said heat generating means, said fluid circulating at least primarily within said pumping sub-circuit when cooling flow requirements are sufficiently low, said valve means including a dump valve and said actuating means including control valve means disposed between said dump valve and said reservoir means for regulating fluid flow from said dump valve into said reser-

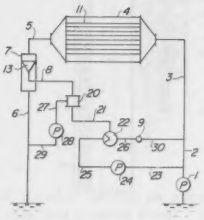
voir means whereby adjustment of said control valve means to evacuate fluid from said dump valve into said reservoir increases fluid flow into said siphon means, wherein said fluid flow circuit further includes temperature-sensitive actuating means for actuating said valve means to increase fluid flow into said siphon means in response to increased temperatures in said heat generating means, whereby high-volume fluid flow is initiated in said cooling sub-circuit by said siphon means.

3,882,931

MEANS FOR CLEANING HEAT CONDUCTIVE CONDUITS OF A HEAT EXCHANGER

Yoshio Kumagai, Takahagi, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 20, 1973, Ser. No. 343,036
Claims priority, application Japan, Mar. 24, 1972, 47-28949
Int. Cl. F28g 1/12
U.S. Cl. 165—95 **12 Claims**



1. Cleaning apparatus for cleaninng heat conductive conduit means of a heat exchanger of the type having heat conductive conduit means, inlet conduit means for supplying heat exchange fluid to said heat conductive conduit means, and outlet conduit means for exhausting the heat exchange fluid from the heat conductive conduit means, said cleaning apparatus comprising:

recovering means provided in said outlet conduit means for recovering conduit cleaning elements present in said heat exchange fluid, separating means connected with the recovering means in fluid flow relationship for separating a portion of the heat exchange fluid from the conduit cleaning elements, and suction means receiving the conduit cleaning elements and remaining heat exchange fluid from said separating means for directing said conduit cleaning elements and remaining heat exchange fluid from the separating means into said inlet conduit means, wherein said suction means comprises a suction pump including nozzle means for injecting fluid into said pump so as to produce a suction pressure portion in said suction pump, suction-inlet means for drawing the conduit cleaning elements with the remaining heat exchange fluid from the separating means under the influence of the suction pressure produced by said nozzle means, and an outlet section connected with said inlet conduit means for discharging the conduit cleaning elements into said inlet conduit means.

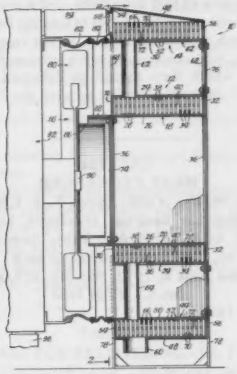
3,882,932

RADIATOR ASSEMBLY

Vernon N. Tramontini, Indianapolis, Ind., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Feb. 25, 1974, Ser. No. 445,085
Int. Cl. F28f 13/12
U.S. Cl. 165—126 **4 Claims**

1. A radiator assembly, comprising; an inner annular radiator having a plurality of axially spaced generally arcuate fluid carrying core elements, arcuate radial flow air passageway means between said core elements, an outer annular radiator surrounding said inner radiator and having a plurality of axially spaced arcuate fluid carrying core elements, arcuate radial flow air passageway means between said outer radiator core elements, an axially extending substantially unobstructed annular space between the inner and outer radiators, fan



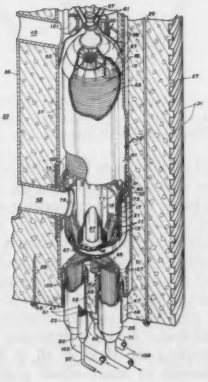
means positioned to convey air axially through said annular space, and means for directing the conveyed air simultaneously radially in one direction through the air passageway means in said inner annular radiator and in the opposite direction through the air passageways means in the outer annular radiator.

3,882,933

HEAT EXCHANGER

Leonard J. Kube, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Oct. 28, 1971, Ser. No. 193,371
Int. Cl. F28d 7/10
U.S. Cl. 165—163 **4 Claims**



1. A heat exchanger comprising a plurality of tube bundles, at least one tube bundle comprising a reheater having a plurality of helical heat exchanger tubes, said tubes being arranged in a plurality of coaxial annular rows along a vertical axis with each tube being in a single row, each row comprising a plurality of said tubes with said tubes in each row being wound helically with respect to the axis of said annular rows, duct means for directing a flow of a heated first fluid downwardly over said tubes along the axis of the helix toward the lower end of said tube bundle and then upwardly through the space

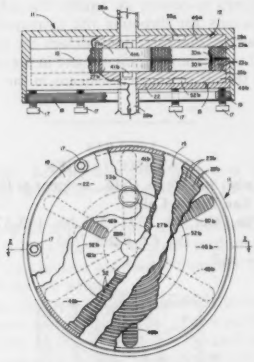
defined by the inner one of said annular rows, means at the upper end of said tube bundle interconnecting the ends of respective pairs of said tubes, said interconnected ends being uniformly spaced circumferentially around the top of said annular rows, a first tube sheet and a plurality of interconnecting tubes extending from said first tube sheet, each to one tube in a respective one of said tube pairs, and a second tube sheet and a plurality of connecting tubes extending from said second tube sheet, each to the other tube in the respective ones of said tube pairs, said connecting tubes intersecting the respective tubes to which they extend at different positions uniformly spaced circumferentially around the bottom of said annular rows.

3,882,934

HEAT EXCHANGER

Stellan Knoos, Malibu, Calif.; Sören F. S. Ljungdahl, Taby, and Bertil Ingemar Bostrom, Danderyd, both of Sweden, assignors to AGA Aktiebolag, Taby, Sweden and Stellan Knoos, Malibu, Calif., part interest to each

Filed June 2, 1972, Ser. No. 259,009
Int. Cl. F28d *9/04*
U.S. Cl. 165—164 **21 Claims**



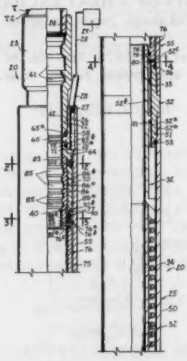
1. A heat exchanger comprising:
a fluid,
inlet means and outlet means for said fluid,
a heat exchange element for receiving the flow of said fluid, said heat exchange element comprising a member having a plurality of coextensive narrow fluid channels formed on a single surface thereof, said channels being defined by walls extending from said surface, multiple distributor means spaced at intervals along said channels for distributing the fluid from said inlet means to all of said fluid channels in parallel, multiple collector means spaced from said distributor means at intervals along said channels for collecting the fluid in all of said channels in common channels at intermediate positions along said fluid channels located at distances from the distributor means which are substantially less in extent than the full length of said coextensive channels and means for feeding the fluid from said last mentioned common channel to said outlet means, and
means for transferring thermal energy between said heat exchange element and a heat conductive medium, the ends of said channel walls away from said surface abutting against said last mentioned means in fluid tight relationship, whereby thermal energy is transferred between said channel wall ends and said last mentioned means.

3,882,935

SUBSURFACE SAFETY VALVE WITH AUXILIARY CONTROL FLUID PASSAGE OPENABLE IN RESPONSE TO AN INCREASE IN CONTROL FLUID PRESSURE

Michael B. Calhoun, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 427,795
Int. Cl. E21b *43/12*
U.S. Cl. 166—224 A **15 Claims**



1. A well flow conductor valve including: a housing having means for connecting it in flow communication with a well flow conductor; valve means disposed in the housing and movable therein between open and closed positions for controlling flow through the housing; operating means in said housing movable longitudinally thereof for actuating said valve to move the same between the open and closed positions; locking means in the housing initially in an inoperative position spaced from said operating means and movable to a position engaging said valve operating means to positively lock said valve operating means in position holding said valve in open position; fluid pressure responsive means on said operating means; means for conducting control fluid pressure to said valve housing for acting on said fluid pressure responsive means to control movement of said operating means in response to such control fluid pressure; means at the surface for controlling fluid pressure conducted through said control fluid conductor means to the valve in response to predetermined conditions; and means providing a control fluid passage into the interior of the valve housing responsive to an increased control fluid pressure after said locking means has been moved to position locking said valve means in open position, said increased control fluid pressure being substantially higher than the control fluid pressure required to operate said operating means.

3,882,936

APPARATUS FOR EVACUATING DRILLING FLUIDS FROM A WELL

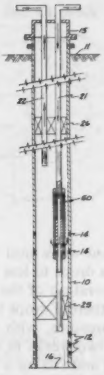
Chudleigh B. Cochran, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Division of Ser. No. 186,994, Oct. 6, 1971, Pat. No. 3,799,268.
This application Jan. 18, 1974, Ser. No. 434,838
Int. Cl. E21b *43/12*
U.S. Cl. 166—224 **16 Claims**

1. Pressure operated apparatus comprising:
a. tubular body means having port means through the walls thereof;
b. sleeve means surrounding said body means in a first position blocking fluid flow through said port means, said

sleeve means including a skirt member axially movable on the existence of a predetermined pressure level in said body means to unblock flow through said port means; and

c. expansible chamber means between said body means and said sleeve means, pressure operable after said unblocking of said port means to axially reposition said sleeve in a second position blocking flow through said port means;



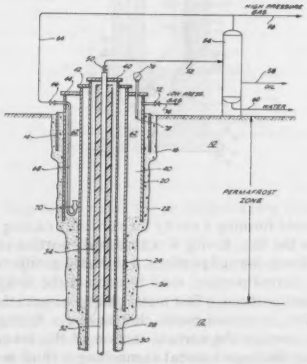
d. said skirt member having an annular surface thereon which in said first position forms a portion of a pressure chamber communicating with the interior of said body means through said port means, said skirt member being fastened to the rest of said sleeve means in said first position by connection means, said connection means being releasable on exposure of said annular surface to said predetermined pressure level to permit said axial movement of said skirt means to unblock said port means.

3,882,937

METHOD AND APPARATUS FOR REFRIGERATING WELLS BY GAS EXPANSION

Joel P. Robinson, Los Angeles, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Sept. 4, 1973, Ser. No. 393,892
Int. Cl. E21b *43/24*, *43/00*
U.S. Cl. 166—267 **19 Claims**



1. A refrigerated well extending from the surface to an underlying petroleum reservoir for conducting hot fluids through a permafrost zone, which comprises:

a closed annular refrigeration chamber defined by inner and outer concentric casings extending a substantial distance into said permafrost zone, said refrigeration chamber lying between said hot fluids conducted through said well and said permafrost;

a production tubing within said inner casing to conduct fluids from said underlying petroleum reservoir to the surface, or vice versa;

at least one gas expansion nozzle located within said refrigeration chamber and adjacent to the bottom thereof, and discharging into said chamber;

gas conduit means to conduct high pressure gas from a source of high pressure gas to said gas expansion nozzle; and

means for exhausting low pressure gas from said refrigeration chamber;

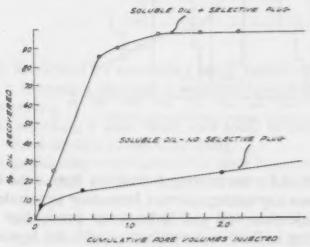
whereby high pressure gas discharged through said gas expansion nozzle into said refrigeration chamber is cooled to a temperature below the permafrost temperature and flowed upwardly through said refrigeration chamber to prevent the transfer of heat from said hot fluids conducted through said well to the surrounding permafrost.

3,882,938

PROCESS FOR RECOVERING OIL FROM HETEROGENEOUS RESERVOIRS

George G. Bernard, La Mirada, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed July 17, 1972, Ser. No. 272,558
Int. Cl. E21b *43/22*, *43/27*
U.S. Cl. 166—270 **9 Claims**



1. In the method of recovering petroleum from heterogeneous subterranean reservoirs having strata of widely varying permeabilities wherein a substantial proportion of the oil is in the more permeable strata and in which a soluble oil miscible with both the connate reservoir oil and with water is first injected into the reservoir through an injection well, and thereafter an aqueous flooding medium is injected to drive the soluble oil towards a spaced production well from which fluids are recovered, the improvement which comprises injecting through said injection well and into said reservoir a first portion of said soluble oil, next injecting one or more aqueous solutions of reagents that react together in the reservoir to form a plugging material that substantially reduces the permeability of the more permeable strata of the formation, and thereafter injecting a second portion of said soluble oil.

3,882,939

MOBILITY CONTROL IN ADJACENT WELLBORES

Richard W. McAtee, Littleton, and Marvin A. Svaldi, Morrison, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed May 14, 1973, Ser. No. 359,816
Int. Cl. E21b *43/22*
U.S. Cl. 166—274 **6 Claims**

1. In a process of flooding a hydrocarbon containing reservoir having an injection means in fluid communication with a

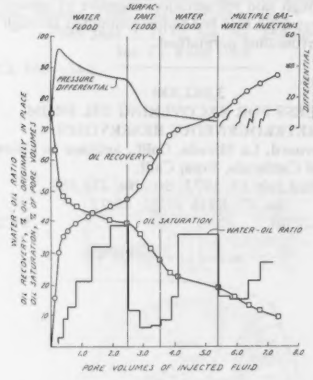
production means and wherein an aqueous biopolymer solution is injected into the reservoir and displaced toward the production means to recover hydrocarbon therethrough, the improvement comprising incorporating into only the front portion of the biopolymer solution a polyalkylene oxide polymer to obtain improved mobility control in areas near the injection means.

3,882,940

TERTIARY OIL RECOVERY PROCESS INVOLVING MULTIPLE CYCLES OF GAS-WATER INJECTION AFTER SURFACTANT FLOOD

Joseph T. Carlin, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 17, 1973, Ser. No. 425,593
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **9 Claims**



1. In a method for recovering petroleum from a subterranean, petroleum containing, porous formation penetrated by at least one injection well and at least one production well, both wells being in fluid communication with the formation, said recovery method being of the type wherein an aqueous surfactant solution is injected into the formation and an aqueous solution of hydrophilic, viscosity increasing polymer is injected into the formation following the surfactant solution and oil displaced by the injected fluids is recovered from the formation via the production well, wherein the improvement comprises:

a. injecting from about 2 to about 8 slugs of gas the volume of which is from about 0.2 to about 20.0 pore volume percent with a slug of from about 5 to about 50 pore volume percent water injected between succeeding gas slugs into the formation after injection of the solution of the hydrophilic viscosity increasing polymer; and

b. injecting water into the formation after injection of all of the slugs of gas to displace the gas, surfactant solution and solution of hydrophilic viscosity increasing buffer and formation petroleum toward the production well.

3,882,941

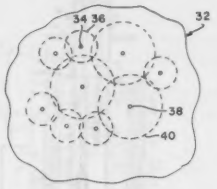
IN SITU PRODUCTION OF BITUMEN FROM OIL SHALE

Arnold H. Pelofsky, East Brunswick, N.J., assignor to Cities Service Research & Development Co., Cranbury, N.J.

Filed Dec. 17, 1973, Ser. No. 425,449
Int. Cl. E21b *43/24*
U.S. Cl. 166—303 **6 Claims**

1. A process for recovering hydrocarbon product from asubterranean deposit of oil shale which comprises the steps of:

a. introducing heat energy in the form of hot fluids not containing oxygen into said deposit through one or more wells extending into the deposit, said heat energy being introduced in quantities sufficient to heat the deposit in the vicinity of the wells to more than about 50°F above its transition temperature and until the pressure at the bottom of the wells is from at least 200 to about 1,000 psi about the formation pressure of the deposit;



b. then shutting in said wells until the temperature in the vicinity of the wells drops to less than about 50°F above the transition temperature of the deposit until the pressure at the bottom thereof drops to less than about 50 psi above formation pressure, with the shutting in period lasting from about two weeks to about 6 months;

c. repeating steps (a) and (b) for a period of from about 1 to about 10 years; and

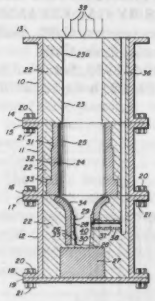
d. producing bitumen through said wells.

3,882,942

MOLD MODIFICATIONS FOR ELIMINATING FRECKLE DEFECTS IN ROLL CASTINGS

Pradeep Kumar Kohatgi, Bangalore, India, and Louis R. Woodyatt, Whitehall, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 24, 1973, Ser. No. 363,682
Int. Cl. B22d *15/00*
U.S. Cl. 164—353 **7 Claims**



1. In a mold forming a cavity for vertically casting a rolling mill roll, or the like, having a central body portion separating upper and lower journal portions, a sinkhead positioned above the upper journal portion, sand to contact the sinkhead and upper journal portions, a first metal chill to contact the central body portion, a second metal chill having a facing of sand thereon to contact the vertical section of the lower journal portion and the improvement comprising a third metal chill having a continuous flat upper face and a facing of sand thereon to contact the horizontal terminus of the lower journal portion so as to provide for the casting of a rolling mill roll free of freckle defects.

3,882,943
DISPERSAL OF FLAMMABLE MATERIALS

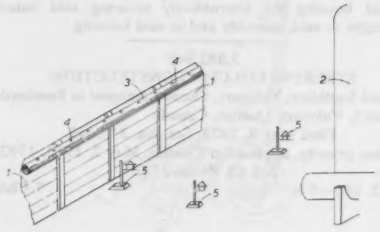
Arthur Leslie Cude, and Henry George Simpson, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 145,714, May 21, 1971. This application Aug. 20, 1973, Ser. No. 389,540

Claims priority, application United Kingdom, May 27, 1970, 25528/70

Int. Cl. A62c *3/00*

U.S. Cl. 169—60 **6 Claims**



1. Equipment for dispersing a cloud of flammable vapour which comprises a solid vertical barrier at ground level and spaced from a potential source of said flammable vapour, means associated with the solid barrier for ejecting jets of steam at a high velocity upward from the ground, said means comprising at least one pipe of a length at least as great as the distance between the potential source of flammable vapour and the solid barrier, thereby dispersing the vapour cloud by entrainment of the vapour with air, vapour detectors positioned between the potential source of flammable vapour and the solid barrier and actuation means for the steam jet system responsive to a signal from the detectors.

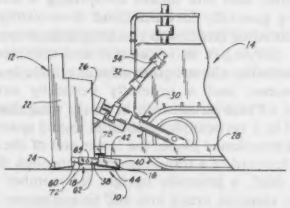
3,882,944
DOZER DRAG-BEAM

Donald Zimmerman, P.O. Box X, Arma, Kans. 66712

Filed Nov. 12, 1973, Ser. No. 414,896

Int. Cl. A01b *49/02*

U.S. Cl. 172—199 **4 Claims**



1. A drag-beam means for an earthworking blade, comprising:

a. an earthworking blade;

b. a drag-beam having a leading edge portion and a trailing edge portion;

c. mounting means on a rear side portion of said earthworking blade constructed and adapted to receive and mount said drag-beam, said mounting means having a first mounting portion secured to said rear side portion of said earthworking blade and having a second mounting portion pivotally mounted on said first mount portion,

d. said mounting means has means to limit upward and downward pivotal motion of said drag-beam relative to said earthworking blade such that when said earthworking blade has its cutting edge portion in cutting position on a ground surface said beam trailing edge portion is disposed horizontally above said cutting edge portion and said beam leading edge portion is horizontally disposed above said beam trailing edge portion, and

e. said drag-beam mounted on said second mounting portion, and extending substantially from opposite ends of said earthworking blade when mounted thereon.

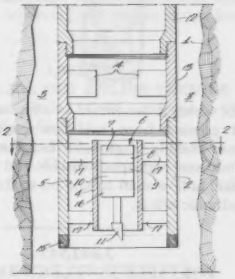
3,882,945
COMBINATION LASER BEAM AND SONIC DRILL

Bernard J. Keenan, Jr., West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Nov. 2, 1973, Ser. No. 412,212

Int. Cl. E21b *7/00*

U.S. Cl. 175—16 **7 Claims**



1. A method for recovering liquid reserves from a subterranean formation through a wellbore containing a drill string comprising

a. attaching a laser beam and sonic housing to the lower most section of the drill string,

b. positioning a self-contained laser beam and sonic assembly within the laser beam and sonic housing containing a voltage generator, a laser beam generator electrically connected to and deriving its power from the voltage generator and a sonic generator electrically connected to and deriving power from the voltage generator,

c. actuating the voltage generator by drilling fluid passing through the drill string,

d. generating a sonic beam and transmitting it through the drilling fluid into the formation,

e. separating the drilling fluid entering the formation cavity into a plurality of jet streams, and

f. generating a laser beam and projecting it into the formation.

3,882,946
TURBODRILL

Rolen Arsenievich Ioannesian, naberezhnaya Tarasa Shevchenko, 1/2, kv. 49, and Jury Rolenovich Ioanesian, Matveevskaya ulitsa, 18, korpus 2, kv. 63, both of Moscow, U.S.S.R.

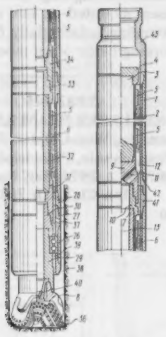
Filed Apr. 24, 1974, Ser. No. 463,796

Int. Cl. E21b *3/12*

U.S. Cl. 175—107 **19 Claims**

14. A turbodrill for drilling gas an oil wells in an assembly with a drilling unit comprising drill pipes, through which a drilling fluid is supplied into the turbodrill, and a mud pump for delivering said drilling fluid into said drill pipes; said turbodrill comprising in combination, a housing, two multistage hydraulic turbines operating with different speeds and hydrodynamic braking stages arranged in said housing one after another and operating in succession; the first element along the path of the drilling fluid coming from said drill pipes being

the low-speed turbine and the hydro-dynamic braking stages which pass the total flow of said fluid; the next element along the path of said drilling fluid being a high-speed turbine capable of utilizing a high pressure drop and developing a high torque; a hollow shaft mounting said high-speed turbine and



one end of which is connected to a bit; and a device dividing the fluid coming from said low-speed turbine and hydrodanymic braking stages into two flows, one of which is directed into said high-speed turbine and the other is directed through said hollow shaft to said bit so the turbodrill operates with a hydraulic effect.

3,882,947

PORTABLE JEWELER'S BALANCE

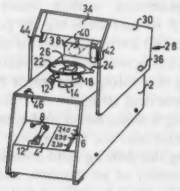
Max Karl Appius, Berneck, Switzerland, and Adolf Ast, Messtetten, Germany, assignors to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

Filed Feb. 11, 1974, Ser. No. 441,672

Claims priority, application Switzerland, June 15, 1973, 8687/73

Int. Cl. G01g *23/32*

U.S. Cl. 177—246 **10 Claims**



1. A top-loading inclination balance comprising, in combination:

a. a housing;

b. a main bearing in said housing;

c. a balance beam normally fulcrumed on said main bearing and having two arms in said housing;

d. a pan carrier assembly;

e. an outer bearing on one of said arms pivotally supporting said assembly, a portion of said assembly movably passing outward of said housing in an upward direction when said balance is in the normal operating condition;

f. a weighing pan on said portion of said assembly outside said housing;

g. a cover pivotally mounted on said housing for movement in an arcuate path toward and away from a closed position in which said cover envelops said weighing pan and said portion of said assembly, said cover, when remote from said position, providing access to said weighing pan;

h. a locking member projecting from said housing into said path for engagement with said cover when the cover moves toward said position and for movement inward of said cover in response to further movement of said cover toward said position;

i. motion transmitting means in said housing connecting said locking member to said beam and to said assembly for disengaging said main bearing and said outer bearing in response to said inward movement of said locking member, and for securing said beam and said assembly in a fixed position relative to said housing;

k. a balance weight carrying a mark representative of the weight thereof; and

l. securing means on said portion of said assembly and on said housing for alternatively securing said balance weight to said assembly and to said housing.

3,882,948

STEERING COLUMN CONSTRUCTION

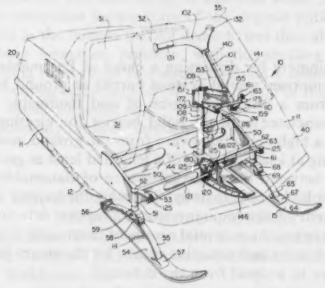
Bertrand Southiere, Valcourt, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada

Filed May 9, 1973, Ser. No. 358,645

Claims priority, application Canada, May 2, 1973, 170280

Int. Cl. B62m *27/02*

U.S. Cl. 180—5 R **7 Claims**

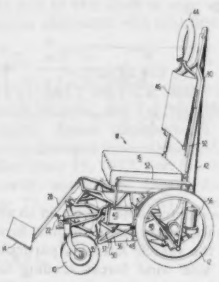


1. A steering mechanism for a relatively small off-the-road vehicle comprising a steering control for manual operation by the operator of said vehicle, ground contacting direction elements angularly displaceable relative to the longitudinal axis of said vehicle for varying the direction of travel of said vehicle, and link means for interconnecting said steering controls and said direction elements to relate the angular position of said direction elements to the angular position of said steering control, said link means comprising a steering column extending generally forwardly and downwardly in a vertical plane extending parallel to the longitudinal centerline of the vehicle, carrying at its upper rear end said steering control, and mounted to the structure of said vehicle in a freely rotatable manner, and a generally vertically extending shaft mounted to said structure in a freely rotatable manner and disposed in a vertical plane parallel to and spaced apart from said first mentioned plane, the lower end of the column being located forward of a transverse plane through the axis of said vertical shaft, a generally upright leg member for each said direction element, crank arm and tie rod means interconnecting the lower end of said shaft with each leg member such that rotation of said shaft causes angular displacement of said direction element which, however, always remain generally parallel to one another, a first crank arm secured to the lower free end of said steering column and extending forwardly therefrom, a second crank arm secured to the upper end of said shaft and extending forwardly therefrom and a tie rod extending transversely across in front of both said column and said shaft and pivotally interconnecting said first and second crank arms, said crank arm and tie rod means and said first and second crank arms being positioned and dimensioned such that when said steering control is at the middle point of its total angular displacement, said direction elements extend parallel to the longitudinal axis of said vehicle.

3,882,949
UNIVERSAL WHEELCHAIR FOR THE SEVERELY DISABLED

David M. Anderson, Oakland, Calif., assignor to Government of the United States, Washington, D.C.

Filed Nov. 16, 1972, Ser. No. 307,202
Int. Cl. B62d 63/02
U.S. Cl. 180—8 A 36 Claims

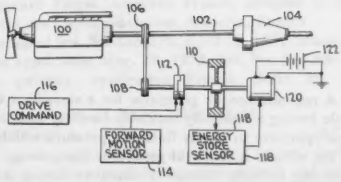


1. A universal wheelchair for the severely disabled, comprising:
four wheels;
a frame connecting said wheels;
a seat;
raising and lowering means connected to said frame and said seat for causing the height of said seat to be continuously adjusted between a lowered position 8 inches above ground and a raised position about 24 inches above ground, said raising and lowering means comprising an actuator, connecting said frame and said seat, and power means connected to said actuator for lengthening and shortening said actuator thereby raising and lowering said seat;
power means connected to said frame for propelling the wheelchair; and
curb climbing means connected thereto for causing the powered climbing of the wheelchair onto and off of curbs while keeping said seat substantially level, said curb climbing means being powered by the lengthening and shortening of said actuator.

3,882,950
VEHICLE POWER SYSTEM FOR LIMITED VEHICLE MOVEMENT WITHOUT USE OF FUEL

James Neil Strohlein, 11618 Hitching Post Ln., Rockville, Md. 20852

Filed July 11, 1972, Ser. No. 270,867
Int. Cl. B60k 9/00
U.S. Cl. 180—54 R 11 Claims

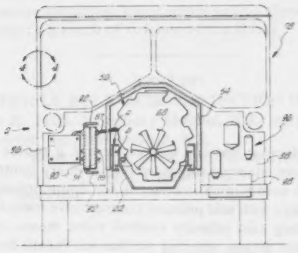


1. A power system for a vehicle having a body and a power-responsive motion producing means connected with the body for producing movement thereof, said power system including,
engine means for operative connection with the motion producing means to supply power thereto for movement of the body,
power takeoff means connected with said engine means for diverting a portion of the power output of said engine means,
mechanical power storage means, connected with said power takeoff means, for accumulating and storing the power diverted by said power takeoff means in an amount sufficient to propel said vehicle for limited distances when the velocity of said vehicle has diminished to a predetermined speed, or from a standstill, utilizing only said accumulated power, and
first selectively operable power connection means, independent of said power takeoff means, for operatively connecting only said mechanical power storage means directly with the motion producing means to supply stored power to the motion producing means when the speed of said vehicle is less than the predetermined speed while simultaneously rendering said engine means inoperative.

3,882,951
QUIET SLIDE OUT ENGINE VEHICLE

Challie Conley, West Covina, Calif., assignor to Hallamore Inc., Fountain Valley, Calif.

Filed Jan. 22, 1973, Ser. No. 325,513
Int. Cl. B60k 5/10
U.S. Cl. 180—64 L 12 Claims



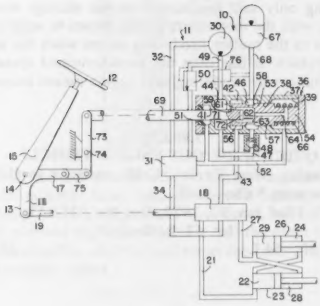
1. A vehicle having a housing body, an engine connected to a drive train for moving the vehicle, a source of electrical power such as electrical batteries, electrical power means extending between the engine and the vehicle housing and fluid conduit means extending between the engine and the vehicle housing comprising:
a chassis frame member including two interconnected parallel chassis rails mounted on the housing body;
a movable engine mounting member including two parallel mounting rails interconnected and supporting the engine and a lower supporting member connected to and movable with the two mounting rails, the lower supporting member supporting the source of electrical power;
roller means positioned between the respective chassis rails and the mounting rails for permitting the mounting rails to be relatively movable on the chassis frame whereby the engine can be moved along the chassis frame member out of the housing body adjacent a first end of the chassis frame member;
means for interlocking the chassis frame member and the movable engine mounting member;
means for alignment of the engine mounting member with the chassis frame member, and
means adjacent the movable engine mounting member for disconnecting the electrical power means and the fluid conduit means between the engine and the vehicle housing.

3,882,952

STEERING SYSTEM WITH SECONDARY STEERING MEANS

Elmer R. Crabb, Pekin, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Oct. 26, 1973, Ser. No. 409,866
Int. Cl. B62d 5/08
U.S. Cl. 180—79.2 R 10 Claims



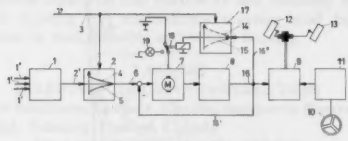
1. In a vehicular steering system having; a source of fluid under pressure, steering motor means, primary control valve means, fluid communication means for communicating said pressure source with said primary control valve means, and for communicating said primary control valve means with said steering motor means, steering mechanism means for actuating said primary control valve means to control the flow of pressure fluid to and from said steering motor means, the improvement comprising; secondary steering means for providing a supply of pressure fluid for operating said steering motor means in the event of failure of said source of fluid under pressure to supply said steering motors, said secondary steering means including accumulator means supplied by said source for storing fluid under pressure for selective passage to said steering motor means, secondary control valve means for controlling fluid flow from said source to said accumulator means and from said accumulator means to said steering motor means, said secondary control valve means operative for automatically permitting fluid flow from said source to said accumulator means while concurrently blocking flow from said accumulator means to said steering motor means when the pressure of said source is above a first predetermined value, said secondary control valve means being further operative for communicating flow from said accumulator means to said steering motor means while concurrently blocking flow from said source to said steering motor means when the pressure of said source is below said first predetermined value, said steering mechanism means including mechanical linkage means directly connected to said secondary control valve means and to said primary control valve means for actuating said secondary control valve means concurrently with said primary control valve means to provide immediate mechanical control of fluid flow from said accumulator means to said steering motor means when the pressure of said source drops below said first predetermined value.

3,882,953

COMPENSATION OF SIDE WIND FORCES TENDING TO UNDESIRABLY MOVE A VEHICLE LATERALLY

Wolfgang Maisch, Schwieberdingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 5, 1973, Ser. No. 413,059
Claims priority, application Germany, Nov. 13, 1972, 2255602
Int. Cl. B62d 5/06
U.S. Cl. 180—79.2 8 Claims



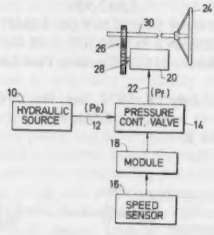
1. In a vehicle having turnable wheels, in an arrangement of the type operative for compensating against forces tending to undesirably move the vehicle laterally, particularly for compensating against side wind forces tending to undesirably move the vehicle laterally, of the type including means for effecting an automatic compensatory turning of said vehicle wheels in a direction and to an extent counteracting the tendency of such forces to undesirably move the vehicle laterally, an arrangement, comprising, in combination, speed-determining means for determining the speed of said vehicle; and compensation-limiting means connected to said speed-determining means and connected to said means for effecting an automatic compensatory turning of said vehicle wheels, and operative for establishing a vehicle-speed-dependent upper limit upon the extent of said automatic compensatory turning of said vehicle wheels.

3,882,954

REACTION TORQUE GENERATOR FOR VEHICLE STEERING SYSTEM

Naohiko Inoue, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Mar. 26, 1974, Ser. No. 454,796
Claims priority, application Japan, Mar. 27, 1973, 48-34133
Int. Cl. B62d 5/00
U.S. Cl. 180—79.2 4 Claims



1. A reaction torque generator for a steering system for a vehicle having a manually rotatable steering shaft and source means operative to supply fluid at a pressure which increases with the vehicle speed, said generator comprising:

a casing defining therein a chamber having a first stop formed on the inner surface thereof;

a shaft having a first section rotatable within said chamber and a second section sealingly extending externally through said casing for rotatable engagement with the steering shaft, said first section having a second stop formed thereon and arranged such that the steering shaft

is in a position to steer the vehicle in a straight line when said first and second stops are angularly aligned; and

first and second members slidably disposed in said chamber, each being exposed at one end thereof to fluid from the source means, said first member being engagable at its other end with the sides of said first and second stops facing in one direction about the axis of said shaft and said second member being engagable with the sides of said first and second stops facing in the opposite direction about the axis of said shaft to urge said second stop toward angular alignment with said first stop.

3,882,955

SAFETY BELT DEVICE FOR VEHICLES

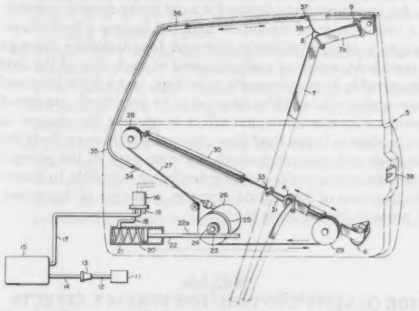
Yuichiro Kaneko, Nagoyo, and Takfhiko Nishikawa, Inazawa, both of Aichi, Japan, assignors to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Aichi-pref., Japan

Filed June 19, 1973, Ser. No. 371,562

Claims priority, application Japan, June 22, 1972, 47-062612; June 22, 1972, 47-062613; June 22, 1972, 47-062614

Int. Cl. B60r *21/10*

U.S. Cl. 180—82 C **4 Claims**



1. A safety belt device for vehicles, comprising a door switch operating when a door is opened and closed, a solenoid valve actuated by the operation of said door switch, vacuum cylinder means connected through said solenoid valve to a vacuum tank which is connected to an intake manifold and including a pistion disposed therein for a reciprocal motion, guide ring means operated by said vacuum cylinder means, and belt means loosely passed through and operated by said guide ring means, said piston being constantly urged to one end of said vacuum cylinder means by a coiled spring and having a free end portion formed with a rack gear which is engaged with a pinion gear fixedly mounted on a drive shaft.

3,882,956

SUSPENSION DEVICE FOR VEHICLE DRIVERS CAB

Alain Edouard Plegat, Asnieres, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

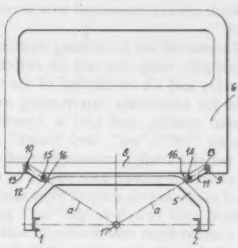
Continuation of Ser. No. 135,230, April 19, 1971, abandoned. This application Mar. 28, 1973, Ser. No. 345,686

Claims priority, application France, June 18, 1970, 70.22489

Int. Cl. B62d *27/06, 33/06*

U.S. Cl. 180—89 A **4 Claims**

1. A car over engine vehicle comprising a frame including spaced side members interconnected by a front end member and a cross-member spaced rearwardly of said front end member, said frame having a longitudinal axis about which twisting of the frame occurs during movement of the vehicle, and an engine unit supported by said frame between said side members, and a cab mounted on said frame above said engine unit when in operating position, said cab being mounted at its front end of said frame adjacent said front end member, and means mounting the rear end of said cab on said cross-member for constraining said cab and said cross-member to preclude movement therebetween normal to said longitudinal axis while enabling relative angular movement therebetween about said longitudinal axis, said means comprising exclusively a pair of rigid links, one at each side of said frame, supporting said cab in spaced relation above said cross-member, said links connected by pivot means to said cab and to said cross-



member for unimpeded relative motion therebetween, the pivots for each link being spaced vertically in the same direction from the longitudinal axis of the frame, and said links being disposed, when the cab is in normal operating position, so that imaginary straight lines passing through the pivot axes of the respective links intersect at the longitudinal axis of the frame so that the rear of the cab can pivot relative to the frame and crossbar about said longitudinal axis to eliminate twisting of the cab as a result of twisting of the frame.

3,882,957

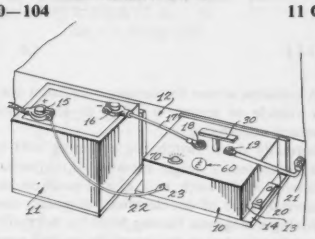
VEHICLE ROLL-OVER PROTECTION DEVICE

Charles H. Fritz, Woodbury Heights, N.J., assignor to SGL Industries, Inc., Haddonfield, N.J.

Filed June 20, 1974, Ser. No. 481,340

Int. Cl. B60r *18/02*

U.S. Cl. 180—104 **11 Claims**



1. An assembly for stopping and preventing a vehicle having an engine compartment and an engine therein from running in the event of vehicle tilt or roll-over, said assembly comprising

a. a system essential for engine operation,

b. a means for selectively interrupting and completing said essential system to thereby respectively stop said vehicle engine operation and allow said vehicle engine operation, said means including (i) a movable member selectively movable into and out of engagement with means within said essential system for respectively completing and interrupting said system, said member normally biased out of engagement with said means within said essential system, (ii) a main solenoid operatively associated with said member for moving said member into and out of engagement with said essential system means (iii) a module, said module comprising a unitary ascembly of

a pilot relay operatively associated with said main solenoid, said pilot relay including an armature operatively connected to relay contact, and first and second solenoids acting in opposition on said armature to move said armature into either a first or a second position respectively, said armature remaining latched in the position to which it is moved until acted upon by the other solenoid,

a tilt switch operatively associated with said second solenoid for providing energization of said second solenoid when said vehicle is tilted more than a predetermined amount, said tilt switch always connected to a source of electircal power, and

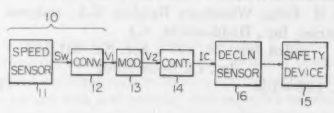
a plurality of terminals for facilitating electrical connection between said pilot relay and said tilt switch, and between said pilot relay and tilt switch and of the components of said means for selectively interrupting and completing said essential system, and (iv) a 3-position operating switch having "off", "on", and "reset" positions, said operating switch having a contact thereof connected to a source of electrical power, said switch in the "off" position thereof supplying no current from said source to said relay contact, said switch in the "on" position thereof supplying current from said source to said relay contact, and said switch in the "reset" position thereof supplying current from said source to said first solenoid.

3,882,958

COLLISION SENSOR FOR MOTOR VEHICLE SAFETY DEVICE

Akio Hosaka, and Kosaku Baba, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohma City, Japan

Filed Nov. 21, 1972, Ser. No. 308,560
Claims priority, application Japan, Feb. 1, 1972, 47-12824
Int. Cl. B60r *21/02*
U.S. Cl. 180—105 E **9 Claims**



1. A collision sensor for sensing a collision condition of the motor vehicle to actuate a safety device mounted thereon, said sensor comprising:

a normally open switch for actuating said safety device when closed, a weight member of magnetic material for moving said switch to a closed position in response to inertial force of deceleration, magnetic means for producing a magnetic biasing force for normally biasing said weight member in the normally opened position, and

means for varying said magnetic biasing force according to vehicle speed so that said biasing force is reduced as the vehicle speed increases, said means for varying said magnetic biasing force comprising:

means for generating a first signal of a magnitude proportional to the rotational speed of a vehicle wheel;

means for generating a second signal responsive to said first signal, the magnitude of said second signal being arranged to follow that of said first signal during an increase and a slow decrease in magnitude of said first signal but to decrease at a predetermined rate during a rapid decrease in magnitude of said first signal;

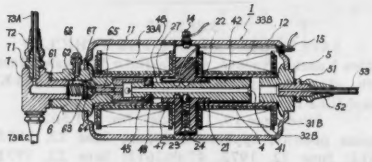
means for generating a third signal of a magnitude controlled by said second signal, said third signal being received by said magnetic means, for varying said magnetic biasing force, whereby said magnetic member is movable to its switch closing position only at the time the inertial force is of such magnitude as to overcome the magnetic biasing force.

3,882,959

SAFETY DEVICE FOR CAR BRAKE SYSTEM

Ching-Chang Hsieh, Taipei, China /Taiwan, assignor to Safety Drive Industrial Co., Ltd., Taipei, China /Taiwan

Filed Apr. 30, 1973, Ser. No. 355,709
Int. Cl. B60r *25/08*
U.S. Cl. 180—114 **9 Claims**



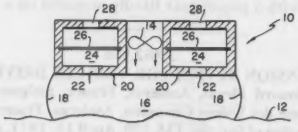
1. An auxiliary safety device for a car brake system comprising a center core of insulation material having a hole therethrough, a plunger slidably disposed longitudinally through the core hole, a pair of coils disposed at each side of the said core operable to give opposite polarities, and a main inlet and a main outlet, said coils be adapted to be selectively energized to produce an electromagnet effect to operate the plunger to open or close a brake fluid flow channel which starts from the main inlet and extends through a center path of the plunger toward the main outlet, said device being operable to detect leakage or loss of brake fluid pressure, reinforce brake power, and protect the car from theft.

3,882,960

RIDE QUALITY CONTROL FOR SURFACE EFFECTS CRAFT

Freddie W. Wilson, Silver Spring; Albert H. Robbins, Severn; Allen G. Ford, Rockville, and Robert A. Wilson, College Park, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1974, Ser. No. 462,013
Int. Cl. B60v *1/16*
U.S. Cl. 180—118 **4 Claims**



1. A system for improving ride quality of surface effect craft having an air cushion volume comprising:

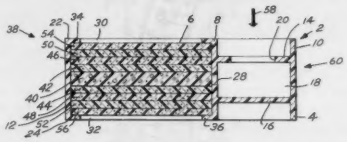
means for automatically varying the volume of the air cushion volume to minimize cushion pressure flucuations and attenuate vertical accelerations when surface irregularities are encountered; and

air flow modulating vent holes coacting with said means for automatically varying the volume of the air cushion volume.

3,882,961
MUFFLER FOR VACUUM-INDUCING MOTOR

Bernard M. Cannan, Downers Grove, and Daniel A. DeBoo, West Chicago, both of Ill., assignors to Servicemaster Industries Inc., Downers Grove, Ill.

Filed Apr. 1, 1974, Ser. No. 456,541
Int. Cl. F01m 1/10
U.S. Cl. 181—50 11 Claims

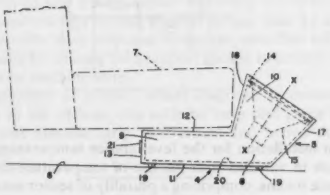


1. An air-filtering, sound-attenuating muffler for a vacuum-inducing motor comprising, in combination:
an attenuator box having an inlet and an outlet, said inlet being in direct communication with said motor for receiving a flow of air from said motor, said attenuator box defining a muffler cavity;
a muffler filler within said muffler cavity, said muffler filler including a series of reticulated foam layers of varying pore densities, said layers being arranged in order of increasing pore density, a first layer having the lowest pore density; and
air control means for directing said flow of air from said inlet into said first layer of said muffler material and through said series of layers and said outlet, whereby the noise produced by said motor and carried by said air is substantially absorbed and attenuated by said muffler.

3,882,962
LOUDSPEAKER EQUIPMENT

Warren Ripple, 2939 Sterling La., Sarasota, Fla. 33581

Filed Oct. 3, 1973, Ser. No. 402,975
Int. Cl. H04r 1/28; G10k 13/00
U.S. Cl. 181—154 3 Claims

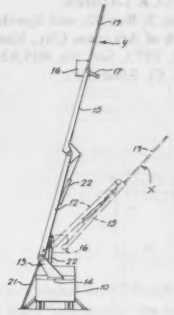


1. Loudspeaker equipment comprising a speaker and a speaker enclosure, the enclosure having enclosure walls including walls defining a speaker chamber one end of which is generally rectangular and of relatively small vertical dimension in relation to its length and is adapted to be accommodated under an automobile seat, the upper and lower enclosure walls diverging to define an enlargement of the chamber at the other end thereof of relatively large dimension and having an opening presented upwardly and forwardly with respect to the automobile seat, and an apertured wall element in said opening with the speaker mounted thereon and exposed through the aperture in the wall and with its axis presented upwardly and forwardly with respect to the automobile seat.

3,882,963
ACCESS EQUIPMENT

Denis Henry Ashworth, Dudley, England, assignor to Simon Engineering Dudley Limited, Stockport, Cheshire, England

Filed June 17, 1974, Ser. No. 480,249
Claims priority, application United Kingdom, June 27, 1973, 30699/73
Int. Cl. B66f 11/04; E06c 5/04
U.S. Cl. 182—2 15 Claims

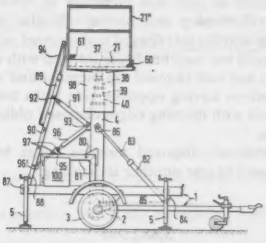


1. Access equipment including an articulated boom structure pivotally mounted at one end on a supporting structure for manipulation relative thereto, and comprising a plurality of articulated booms each of which is equipped with ladder means extending along its length, there being further ladder means telescopically extendible from either end of the outermost boom of the boom structure.

3,882,964
MOBILE LEVER ARRANGEMENT

Heinz Schellenberg, Bahnhofstrasse 31, Wetzikon, Switzerland

Filed Apr. 3, 1973, Ser. No. 347,441
Claims priority, application Switzerland, Apr. 6, 1972, 5082/72; Apr. 6, 1972, 5083/72
Int. Cl. E04g 1/22
U.S. Cl. 182—63 19 Claims



1. A mobile lifter arrangement comprising:
a telescope assembly including a plurality of concentric telescoping tubes;
an undercarriage connected to the outermost said tube;
means for pivotally supporting said telescope assembly on said undercarriage for pivotable movement about a first axis extending transversely of said telescope assembly;
lifting means for effecting pivotation of said tubes about said first axis between raised and lowered positions;
a platform supported by said telescope assembly;
a railing structure around said platform;
pivot means connecting said railing structure to said platform for allowing pivotation of said railing structure relative to said platform about a second axis adjacent and

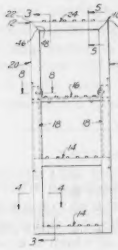
substantially parallel to one edge of said platform, whereby when said tubes are in their lowered position as aforesaid, said railing structure is pivotable about said second axis onto said undercarriage; and

means for releasably securing said railing structure to said undercarriage.

3,882,965
TRUCK LADDER

Charles M. Loomis, R No. 3, Box 92, and Gerald M. Loomis, 1017 N. Ninth St., both of Arkansas City, Kans. 67005

Filed Oct. 12, 1973, Ser. No. 405,826
Int. Cl. E06c *5/02*
U.S. Cl. 182—93 **6 Claims**



1. A truck ladder adapted to be mounted on a truck body, said ladder comprising

a border frame structure composed of inwardly-facing channel members and including a pair of elongated vertical channel side members disposed in laterally-spaced parallel relationship and a channel top step member interconnecting the upper ends of said side members;

and a plurality of fixed step members extending between and secured to said side members in vertically-spaced parallel relationship and having opposite end portions extending into the interiors of said channel side members, said channel top member being integral with said channel members and said channel top member and said channel side members having opposite side walls terminating in upper ends with meeting edges disposed obliquely to said members,

said obliquely-disposed meeting edges being fixedly secured to one another therealong.

3,882,966
LADDER ADAPTER DEVICE

Osvaldo Fasano, Villarbasse, Italy, assignor to Giosue Migliavacca, Origgio, Italy

Filed Sept. 13, 1974, Ser. No. 505,552
Claims priority, application Italy, Sept. 10, 1974, 69799/73
Int. Cl. E06c *7/44*
U.S. Cl. 182—205 **9 Claims**

1. An adapter device for a ladder having two uprights and a plurality of rungs, the device comprising:

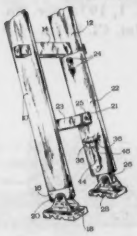
a tubular guide adapted to be rigidly connected to an upright of the ladder;

a pawl pivotally mounted on the guide;

a hollow slide received in the guide and having a longitudinal slot through which the pawl can penetrate the slide;

a rack rigidly connected to an inner surface of the hollow slide and bearing teeth opposite the slot;

the pawl being operable to engage a tooth of the rack to

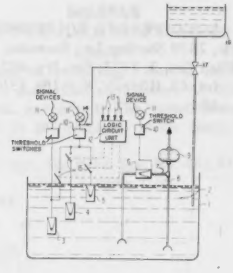


resist forces tending to move the guide with respect to the slide in a predetermined direction.

3,882,967
DEVICE FOR LEVEL AND/OR TEMPERATURE CONTROL OF LIQUIDS

Peter Gulla, Grossheppach, and Dieter Schützenauer, Schorndorf, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Jan. 15, 1973, Ser. No. 323,416
Claims priority, application Germany, Jan. 15, 1972, 2201910
Int. Cl. F01m *11/06, 11/12*
U.S. Cl. 184—103 R **27 Claims**

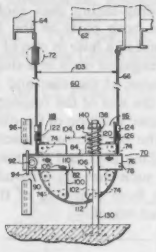


1. An installation for the level and/or temperature control of liquids in vehicles with the use of temperature dependent resistance means, comprising a plurality of sensor means, each of said sensor means including said resistance means being arranged at predetermined points in the liquid to be controlled which is contained in a vehicle container, at least one electronic threshold switching means, control means responsive to at least operating level and/or temperature parameters of the vehicle for selectively closing switching means for connecting at least one of said sensor means with at least one of said electronic threshold switching means in accordance with predetermined input signal values of the operating parameters for ensuring that an unequivocal signal indicative of level and/or temperature of the liquid is produced by said connected sensor means via said electronic threshold switching means for application to an indicating means and/or controlling means under all operating signal valve parameters of the vehicle irrespective of whether the engine is running or the position of the vehicle.

3,882,968
ELEVATOR SYSTEM

John Suozzo, Hackensack, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 1, 1973, Ser. No. 366,234
Int. Cl. B66b *11/08*
U.S. Cl. 187—22 5 Claims



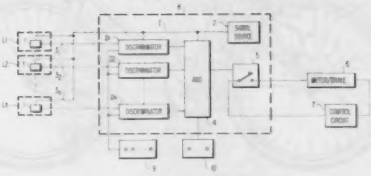
1. An elevator system comprising:
an elevator car;
a counterweight,
motive means mounted above said car and counterweight, hoisting roping disposed in frictional contact with said motive means and interconnecting said car and counterweight; said car and counterweight being moved vertically responsive to said motive means, with said hoisting roping adding weight to said car and counterweight responsive to their relative positions;
compensating means, said compensating means including at least one metallic strip extending from said car to said counterweight in a loop disposed below said car and counterweight, said at least one metallic strip being dimensioned to provide a predetermined weight per unit length selected to substantially reduce the weight unbalance between said car and counterweight caused by said hoisting roping as the relative positions of said car and counterweight change,
tensioning means disposed below the elevator car and counterweight for tensioning and guiding the at least one metallic loop, said tensioning means including support means,
a plurality of first rollers, means mounting said first rollers in spaced relation on said support means, with the at least one metallic strip disposed to contact said first rollers,
bias means for biasing said support means to tension the at least one metallic strip,
and a plurality of second rollers disposed to contact the edges of the at least one metallic strip and guide the at least one metallic strip as it enters and leaves the first rollers.

3,882,969
SAFETY SYSTEM FOR CONTROLLING THE START-UP OF ELEVATORS

Abelardo Podcameni, Rua Raimundo Correia 71/801; Aldo Alves Goncalves, Vila Rialma 156/101, and Sebastiao Kirk, Av. Atlantica 478/308, all of Rio de Janeiro, Brazil

Filed June 14, 1973, Ser. No. 370,186
Claims priority, application Brazil, June 14, 1972, 3809
Int. Cl. B66b *5/00*
U.S. Cl. 187—29 R 6 Claims

1. In an elevator system including a vertical shaft extending through a plurality of building floors and having a shaft opening at each floor to permit passenger access, door means at each floor for closing the respective shaft openings, an elevator cab suspended in the shaft for bidirectional vertical movement therein, control means, and drive motor/brake means for moving the cab in response to the control means, an improved safety circuit comprising:
a. a plurality of electro-mechanical lock means individually and operatively associated with each door means,
b. means for supplying an electrical signal to each of the lock means, the same signal being supplied to each of the lock means and said signal having substantially constant identifying characteristics,

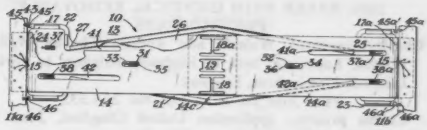


c. a plurality of signal modification means individually included in each lock means for modifying at least one of the signal identifying characteristics in response to the closure of the associated door means, and
d. means for detecting the modification of all of the electrical signals and for enabling the operation of the drive motor/brake means in response thereto.

3,882,970
IMPACT ABSORBING STRUCTURE

Ritchey O. Newman, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 15, 1973, Ser. No. 406,712
Int. Cl. F16f *7/12*
U.S. Cl. 188—1 C 6 Claims

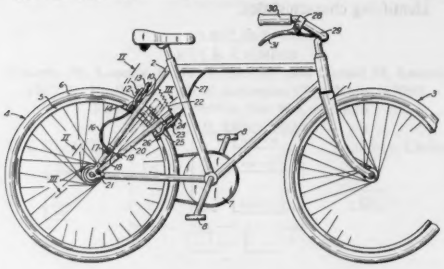


1. A structure which is subject to impact, the structure having
at least a supporting frame, the supporting frame enclosing therein
a region of probable impact,
first and
second frame portions generally oppositely disposed and having therebetween
the region of probable impact,
at least one deformable strap means disposed against and affixed to each frame portion,
a beam member extending generally between the frame portions generally adjacent said straps, the beam member terminating in curved friction surfaces, and
at least one strap movement resisting means in engagement with said strap permitting sliding motion of the said strap over said beam curved friction surfaces and offering a generally predetermined resistance to movement of the strap over the beam.

3,882,971
BICYCLE POWER BRAKE

Victor A. Peckham, Jr., 1151 Fifth St., Manhattan Beach, Calif. 90266

Filed Mar. 13, 1974, Ser. No. 450,886
Int. Cl. B62l *1/12*
U.S. Cl. 188—24 **7 Claims**

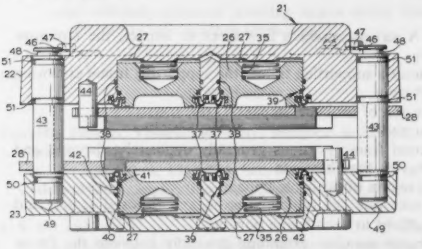


1. In a bicycle having a frame with a fork supported by a wheel rotatably mounted therein, a brake mounted on said fork and straddling the peripheral portion of the wheel, an arm beside the wheel extending substantially radially thereof with its outer end located forward of said brake, means pivotally connecting the inner end of the arm with said fork adjacent the axis of the wheel to allow the outer end of the arm to swing forward and backward in an arc, a floating clamp straddling the peripheral portion of the wheel in front of the brake and normally disengaged from the wheel, means mounting the entire clamp on the outer end of said arm, the arm forming the sole support for the clamp, manually operable means connected with the clamp for clamping it against the forwardly rotating wheel so that the outer end of said arm will be swung forward by the wheel, a brake-actuating wire having one end connected to said brake, and means connecting the opposite end of the wire to said arm adjacent its inner end for applying the brake to the wheel when said arm is swung forward.

3,882,972
DISC BRAKE WITH IDENTICAL REMOVABLE FRICTION PADS

Charles Newstead, Walsall, and Andrew Charles Walden Wright, Lapworth, both of England, assignors to Girling Limited, Birmingham, England

Filed June 20, 1972, Ser. No. 264,533
Claims priority, application United Kingdom, June 22, 1971, 29295/71
Int. Cl. F16d *55/228*
U.S. Cl. 188—72.5 **7 Claims**

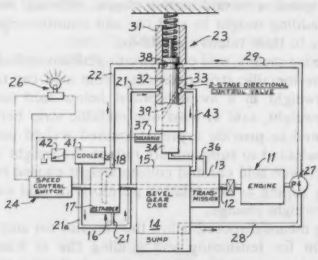


1. A disc brake assembly for co-operation with a brake disc mounted co-axially with, and on one side of a road wheel, the assembly comprising a fixed housing having two parts with a gap between the parts for the passage of the periphery of the disc, the housing being symmetrical about its mid-plane which includes the axis of rotation of the disc, a pair of identical arcuate friction pads moveable relative to the housing and having friction linings which face each other and are arranged to abut on opposite faces of the disc, each pad having leading and trailing ends in relation to one direction of rotation of the disc and having a single lug-like projection intended to extend outside the diameter of the disc at one end and a slot at the other, since the pads are arranged so that the linings face each other the lug-like projections of the pads will lie one at a leading end and one at a trailing end of its respective pad, a pair of removable drag-taking pins each engaged in holes provided therefor in both parts of the housing outside the periphery of a disc and in a hole in one of said lug-like projections, a pair of pins engaged each in a single part of the housing within the diameter of the disc and projecting from the respective part into the slot of the respective pad but remaining clear of the intended position of the disc, and means in said housing for urging the pads towards each other the arrangement of the drag-taking pins and the respective holes in the housing parts being such that the drag-taking pins are insertable and removable from that side of the housing which is remote from the road wheel.

3,882,973
AUTOMATIC RETARDER CONTROL SYSTEM

Gary A. Hakes, Peoria Heights, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Continuation of Ser. No. 273,183, July 19, 1972, abandoned. This application Aug. 9, 1973, Ser. No. 387,159
Int. Cl. B60t *8/12*
U.S. Cl. 188—181 R **1 Claim**



1. A retarder system for a vehicular drive train including a transmission gear ratio means having a power input shaft coupled with a prime mover and a power output means for driving the vehicle, comprising

a retarder of maximum power absorption capacity having a rotor means coupled for rotation with the power input shaft, the retarder also having an inlet conduit and an outlet conduit,

a bypass conduit communicating the retarder inlet and outlet conduits,

a heat exchanger in the bypass conduit and including a relief valve for selectively communicating the heat exchanger with a fluid sump,

speed sensing means associated with a rotating part in the drive train,

a valve coupled for response to the speed sensing means, the valve being responsive to the speed sensing means for movement to a first power absorption position for communicating the source with the retarder inlet conduit, fluid from the source flowing through the retarder, the heat exchanger and the relief valve included therein, and for movement to another position for communicating the source with the retarder outlet conduit and also for communicating the retarder inlet conduit with a fluid sump in order to substantially bypass the retarder while directing fluid through the heat exchanger and maintaining re-

duced fluid flow through the retarder for cooling and lubrication, and

signal means operatively coupled with the retarder to indicate when its maximum capacity is being employed.

3,882,974

AUTOMATIC SLACK ADJUSTER FOR A VEHICLE BRAKE

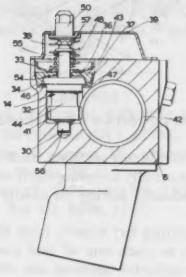
Albert Charles Hill, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Dec. 7, 1973, Ser. No. 422,967

Claims priority, application United Kingdom, Jan. 23, 1973, 3304/73

Int. Cl. F16d *65/56*

U.S. Cl. 188—196 D **11 Claims**



1. An automatic slack adjuster for a vehicle brake having a friction member, and a rotatable braking member with which said friction member is adapted to engage, said slack adjuster comprising a strut assembly having a first part, a second part, and a non-reversible screw-threaded connection between said first and second parts, rotatable adjusting means for rotating said parts relatively to each other to increase the effective length of said strut assembly to maintain at a substantially constant value braking clearance between said friction member and said braking member, a first helical gear on one of said first and second parts, a second helical gear on said adjusting means in mesh at all times with said first helical gear, and means defining between said gears a degree of back-lash of a predetermined value equal to said braking clearance and a normal brake applying movement, said adjusting means normally being located in a first datum position but rotatable into a second datum position only when movement of said strut assembly in a brake applying direction exceeds a said predetermined value to take up said back-lash, whereafter movement of said strut assembly in an opposite direction first takes up the back-lash and then said gears engage to cause the said one part to rotate with respect to said adjusting means which is held fast, and with respect to the other part thereby increasing the effective length of said strut assembly.

3,882,975

BRAKE AND MOUNTING STRUCTURE FOR NONDRIVEN VEHICLE WHEEL

Rudolf Jedlitschka, and Manfred Goeft, both of Friedrichshafen, Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

Filed Mar. 26, 1973, Ser. No. 345,175

Int. Cl. F16d *63/00*

U.S. Cl. 188—271 **4 Claims**

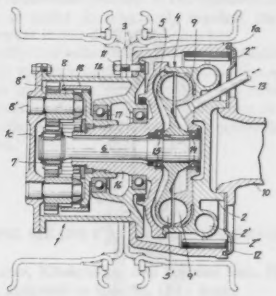
1. A vehicular wheel mounting comprising:

an axle fixedly secured to the body of a vehicle;

supporting means secured to an extremity of said axle;

a retarder including a stationary member carried on said supporting means, a shaft in line with said axle rotatably mounted on said supporting means, and a movable member mounted on said shaft adjacent said stationary member;

a sleeve forming a fixed extension of said supporting means beyond said retarder, said shaft being journaled in said sleeve and projecting therefrom with a free end;



a hollow hub rigid with a wheel rim rotatably journaled on said sleeve, said hub forming a gear housing around said free end and a substantially cylindrical extension of said gear housing immediately surrounding said retarder; and a planetary-gear train in said gear housing said gear train including a planet carrier integral with said hub, a sun gear on said free end and a ring gear fixedly secured to said sleeve.

3,882,976

ARCUATELY OSCILLATING DAMPER

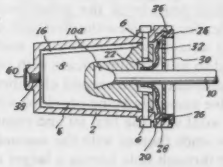
Alan Richard Brine Nash, 39, Abbott's Ride, Farnham, England

Filed Feb. 15, 1973, Ser. No. 332,588

Claims priority, application United Kingdom, Feb. 18, 1972, 7619/72

Int. Cl. F16d *57/02*

U.S. Cl. 188—306 **10 Claims**



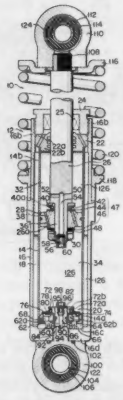
1. A damper comprising, in combination, a body, a chamber within the body, a vane member extending within the chamber from one end thereof and a pivot connection being provided between the body and the vane member in the region of said end of the chamber and defining a pivot axis projecting transversely to the direction of extension of said vane member for constraining relative movement between the vane member and the body to oscillation about said axis, the chamber being of tapered form such that its cross-sectional area reduces with increasing distance from said pivot connection, and a flexible seal additionally being provided between the vane member and the body forming an enclosing boundary for the chamber in the region of said pivot connection.

3,882,977

HYDRAULIC SHOCK ABSORBER

Masae Watanabe, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iawata-shi, Shizuoka-ken, Japan

Filed Apr. 24, 1973, Ser. No. 353,988
Claims priority, application Japan, Apr. 25, 1972, 47-48926
Int. Cl. F16f 9/19
U.S. Cl. 188—322 7 Claims



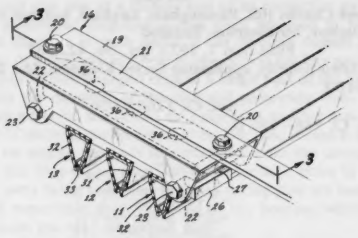
5. A hydraulic shock absorber including:
a cylinder assembly;
a sealing head fixed to one end of the cylinder assembly;
a piston reciprocatingly inserted into the cylinder assembly;
a foot-valve assembly housed in the cylinder assembly near the other end thereof;
a piston rod secured to the piston and passing through the sealing head;
a first chamber defined by the cylinder assembly, piston and sealing head;
a second chamber defined by the cylinder assembly, piston and foot-valve assembly;
a third chamber defined by the cylinder assembly, foot-valve assembly and the other end of the cylinder assembly;
damping oil filled in the first, second and third chambers;
a first by-pass extending through the piston from one end of the piston rod adjacent to the second chamber to an intermediate portion of the piston rod so as to effect communication between the first and second chambers;
a first jet detachably mounted on said one end of the piston rod so as to communicate with one end of the first by-pass adjacent to the second chamber;
the foot-valve assembly being provided with a through hole disposed axial with the first jet and communicating at the respective ends thereof with the second and third chambers, said through hole having a larger diameter than the outer diameter of the first jet;
a second by-pass for effecting communication between the second and third chambers;
mounting means provided in the foot-valve assembly for inserting the second by-pass in the through hole;
the cylinder assembly being provided in the other end with an opening which has a larger diameter than the outer diameter of the first jet and the mounting means and is substantially coaxial with the first jet and through hole; and
a second jet mounted in said mounting means so as to communicate with one end of the second by-pass, whereby the mounting means is drawn out of the cylinder assembly together with the second jet through the opening, and thereafter the first jet is drawn out of the cylinder assembly through the through hole and opening.

3,882,978

TROLLEY MULTI-CONDUCTOR SYSTEM

Arthur M. Cookston, 1340 Watson Ave., Costa Mesa, Calif. 92626

Filed May 3, 1974, Ser. No. 466,811
Int. Cl. B60m 1/30
U.S. Cl. 191—32 13 Claims



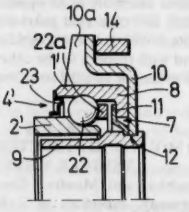
1. An overhead support for a multi-conductor trolley system comprising:
a plurality of conductor sections, each having an insulation sheath substantially covering each respective section;
each of said sheaths having an axially parallel slit formed thereon;
a pair of insulating bar means, each fixed in spaced apart relationship to each one of said conductor sections, so that said conductor sections are disposed substantially parallel and the open slit of each sheath is disposed opposite said bar means, forming a conductor sub-assembly unit;
at least two mounting means, each fixed in spaced apart relationship and disposed overhead;
each of said bar means and the respective ones of said mounting means, each including securing means for securing the two together.

3,882,979

SELF-ALIGNING CLUTCH RELEASE BEARING ARRANGEMENT

Bernhard Limbacher, and Kurt Fadler, both of Schweinfurt am Main, Germany, assignors to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed June 14, 1973, Ser. No. 370,044
Claims priority, application Germany, June 24, 1972, 2230992
Int. Cl. F16d 19/00, 23/00, 13/60
U.S. Cl. 192—98 14 Claims



1. A clutch release bearing arrangement comprising:
a. a first bearing ring having a first axis;
b. a second bearing ring;
c. a plurality of bearing elements of circular cross section angularly distributed about said axis and radially interposed between said bearing rings in simultaneous rolling engagement for rotation of said second bearing ring about said axis,

1. said second bearing ring having an exposed abutment face extending radially relative to said axis,

d. a carrier member having a second axis,

1. said second bearing ring rotatably enveloping said carrier member with sufficient radial clearance for permitting joint radial movement of said bearing rings toward and away from a position in which said first and second axes coincide,

2. respective portions of said first bearing ring and of said carrier member being axially coextensive and axially projecting beyond said second bearing ring in radially spaced relationship;

e. groove bounding means on one of said portions bounding an annular groove about said axes in two opposite axial directions when said axes coincide, said groove being radially open toward the other one of said portions; and

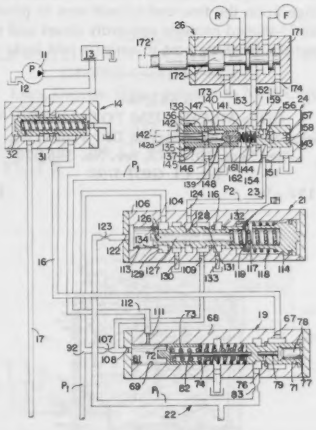
f. a flange radially projecting from said other portion and being received in said groove with sufficient axial clearance to guide said joint movement of said bearing members.

3,882,980

TRANSMISSION CONTROL SYSTEM WITH DUAL PURPOSE MODULATING

William Wayne Blake, Wyoming, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Apr. 27, 1973, Ser. No. 355,191
Int. Cl. B60k *21/00*
U.S. Cl. 192—3.57 **14 Claims**



4. A hydraulic transmission control circuit for selectively actuating at least one of a plurality of speed ratio clutches with hydraulic fluid at a first pressure and for selectively actuating one of a plurality of directional clutches at a second differential pressure, comprising

a fluid source,

a speed ratio selector valve means for communicating fluid at the first pressure to one of the speed ratio clutches,

a directional selector valve for communicating fluid at the second differential pressure to one of the directional clutches,

a differential valve in communication with the fluid source, the differential valve including means to communicate hydraulic fluid at the second differential pressure to the directional selector valve,

a first pressure modulating valve in communication with the source and the differential valve for modulating hydraulic fluid at the first pressure, and

a manually controlled modulating valve arranged to communicate fluid at the differential pressure from the differential valve to the directional selector valve, the manually controlled modulating valve including means for selectively modulating the second differential pressure in two discreet operating modes in order to provide more precise regulating of clutch engagement under different operating conditions, said two discreet operating modes being characterized by the selective modulating means in the manual modulating valve being operable to vary the second differential pressure at two different rates of modulation in order to selectively regulate the degree of engagement in the directional clutches,

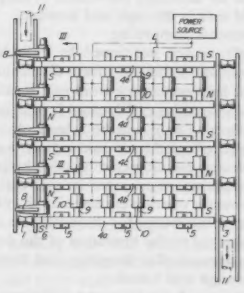
the manually controlled modulating valve further comprising relief means in operative communication with the first pressure modulating valve to selectively reduce the first fluid pressure during selective modulation of the second differential pressure by the manually controlled modulating valve.

3,882,981

SILENCING MEANS FOR STEEL PIPE PRODUCTION LINES

Akio Izumidate, Kitakyushu, and Susumu Itoh, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 16, 1972, Ser. No. 253,756
Claims priority, application Japan, May 17, 1971, 46-33487; Nov. 24, 1971, 46-93615; Nov. 24, 1971, 46-93616
Int. Cl. B65g *11/20*
U.S. Cl. 193—40 **20 Claims**

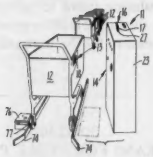


1. A silencing means for use in steel pipe production line skid stations, said means comprising a plurality of skid rails for rolling a plurality of steel pipes, said rails being spaced from one another and inclined downwardly from a steel pipe feed-in end to a feed-out end, in use the steel pipes being fed to said steel pipe feed-in end one after another, said skid rails being provided with a plurality of non-magnetic regions dividing each said skid rail into a plurality of magnetic regions, magnetic bodies magnetically coupling corresponding magnetic regions of adjacent skid rails, exciting coils for providing predetermined magnetic flux extending in magnetic circuits each formed by the associated magnetic body, one of said steel pipes, and the magnetic regions of said adjacent skid rails, and means for continuously energizing said exciting coils such that said skid rails assume opposite magnetic polarities on opposite sides of each of said non-magnetic regions.

3,882,982
METHOD AND APPARATUS FOR ENCOURAGING RETURN OF SHOPPING CARTS

Robert M. Smith, Daly City, Calif., assignor to Charles Cara, San Francisco, Calif., a part interest

Filed Mar. 7, 1969, Ser. No. 805,200
Int. Cl. G07f 1/06
U.S. Cl. 194—4 C 8 Claims



1. A device for detecting movement of shopping carts through a location on a passageway and dispensing an article in response to said movement, comprising

an indicia carried on each of the shopping carts to be detected,

a detector for detecting movement of shopping carts carrying said indicia through said location,

said detector comprising

a light source positioned to provide reflective light from said indicia in a form discriminating from ambient light emanating from said location,

a photosensitive cell located in position to receive said reflective light and be selectively responsive to the light reflected from said indicia, and

an electric circuit including said photosensitive cell and switch means operated by said cell, and

a dispenser operatively associated with said circuit and its switch means for dispensing an award medium in response to the operation of the detector caused by movement of a shopping cart carrying said indicia through said location,

said dispenser being located a sufficient distance from the detector that a person pushing the shopping cart through the detector location cannot reach the article dispensed without continuing along the passageway beyond the operative location.

3,882,983
LOCK

Donald H. Smith, Crystal, and Walter H. Krueger, Wilmette, both of Ill., assignors to Walter H. Krueger, Wilmette, Ill.

Filed June 27, 1974, Ser. No. 483,787
Int. Cl. G07f 5/26
U.S. Cl. 194—51 4 Claims

1. A coin operated, key actuated lock wherein the key is retained in unlocked position and released in locked position, the improvement comprising:

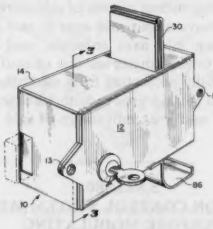
a. a housing having front, back, top, side and bottom walls;

b. a vertically-extending coin chute mounted to said top wall and extending upwardly from said wall and interiorly in said housing and terminating short of said bottom wall;

c. a toggle catch having an inverted U-shaped member and an integrally-formed arm on said member extending at right angles thereto, the free end of said arm terminating partially interiorly in said chute, said arm pivotally secured adjacent said chute;

d. an integrally-formed slide bolt, cam block, blocking post and coin retention plate adapted to be shifted laterally as one piece;

e. said inverted U-shaped member seated on said blocking post to retain said bolt in inactivated position;



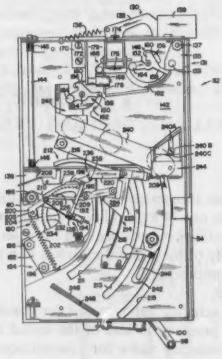
f. tumbler means on said front wall having a removable key, said key and tumbler means actuatable only when a coin is in said chute; and

g. cam pin means on said tumbler means seated in said cam block whereby, when a coin is inserted in the chute, it will impinge upon the free end of said arm to pivot said inverted U-shaped member upwardly about said pivot and release the blocking post to activate said lock.

3,882,984
COIN MECHANISM TOTALIZER

Karl Knickerbocker, 400 Baycrest Dr., Venice, Fla. 33595

Filed Sept. 10, 1973, Ser. No. 396,070
Int. Cl. G07f 5/08
U.S. Cl. 194—94 16 Claims



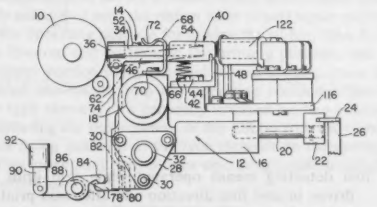
1. A coin controlled mechanism for use in combination with a dispensing machine including an access door having a latch means attached thereto to control the opening of the access door to permit dispensing of products from the dispensing machine upon receipt of the correct amount of coins in said coin controlled mechanism, said coin controlled mechanism comprising actuator means and coin chute means, said actuator means including latch control means disposed to engage the latch means of the dispensing machine, said latch control

means movable between a dispensing and non-dispensing position, said actuator means also including a totalizer operator means a totalizer register means operatively interconnected to one another, said totalizer operative means disposed to engage said latch control means to control movement of said latch control means from said non-dispensing to said dispensing position, totalizer control means including register actuator means said register actuator means movable betweeen a first and second position in response to coins passing through said coin chute means, said register actuator means disposed to selectively engage said totalizer register means to control movement thereof in response to coins passing through said coin chute means and register control means comprising at least one register actuator stop means disposed to engage said register actuator means to control the movement thereof, said coin chute means comprising a plurality of coin passage to control the direction of coins inserted therein with respect to at least the dimension of the coin inserted therein, said register actuator means disposed to engage coins inserted into said coin chute means to at least partially control movement thereof, said register actuator means being disposed relative to said totalizer register means and said register actuator stop means to simultaneously engage said totalizer register means and said register actuator stop means when in said second position in response to coins passing through each respective coin passage to selectively control the extent of movement of said totalizer register means relative to said latch control means whereby said totalizer means advances incrementally to permit movement of said latch control means to said dispensing position when the proper combination of coins registered by said totalizer means register means.

3,882,985
TILTABLE MATRIX PRINT HEAD TO PERMIT VIEWING OF THE CHARACTERS

George N. Liles, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed July 23, 1973, Ser. No. 381,974
Int. Cl. B41j *3/04*
U.S. Cl. 197—1 R **8 Claims**

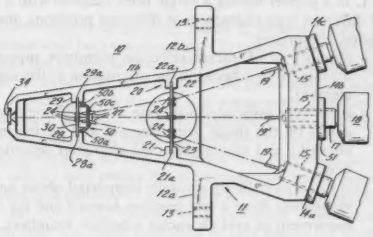


1. In a wire matrix printer having a platen, a carriage means, and traversing means for traversing said carriage means along a line of printing on said platen, the improvement comprising:
a wire guide housing having a front end located adjacent to said platen, and a rear end;
mounting means for pivotally mounting said housing at said rear end to said carriage means to enable the housing to be pivoted between a first position in which said front end is aligned with said line of printing and a second position in which said front end dips below said line of printing to enable said line of printing to be viewed;
wire plungers slidably mounted in said housing;
plunger actuator means connected to said wire plungers and said carriage means to actuate said plungers to print in response to a control means;
said wire plungers each having one end extending from said rear end, in a straight line and lying in a plane which is parallel to said line of printing, and being secured to said plunger actuator means;
pivoting means to pivot said front end of said housing between said first and second positions to pivot only said housing and the plungers therein to provide a low inertia print head in which the housing and the wire plungers therein pivot relative to said carriage means between said first and second positions, but said actuator means remain fixed relative to said carriage means.

3,882,986
JEWEL BEARINGS FOR PRINTER HEADS AND THE LIKE

Robert Howard, Roslyn, N.Y., assignor to Centronics Data Computer Corporation, Hudson, N.H.

Division of Ser. No. 179,627, Sept. 13, 1971, Pat. No. 3,802,543. This application Feb. 11, 1974, Ser. No. 441,467
Int. Cl. B41j *3/06*
U.S. Cl. 197—1 R **9 Claims**



1. A movable unitary printer head assembly for use in impact printers of the dot matrix type comprising:
a housing having front and rear walls joined by a pair of side walls and a floor defining a hollow interior;
a plurality of print wire driving means secured to said rear walls;
each of said driving means including a print wire extending through said housing rear wall with their forward free ends extending through said hollow interior and terminating adjacent said front wall;
spacing means secured within said front wall for maintaining the free ends of said print wires in a predetermined alignment;
first and second print wire positioning and guiding assemblies mounted in a stationary fashion at spaced intervals within said housing and adjacent said front and rear walls respectively;
jewel bearing means secured to said guiding assemblies and having openings each adapted to receive an associated print wire therethrough for substantially restraining transverse movement of the print wires and maintaining a plurality of said print wires in a predetermined pattern to retain the gradual curvature assumed by the print wires between said front and rear walls while significantly reducing wear of said wires even after long and repeated high speed operation and use, each of said guiding assemblies being further comprised of hollow curved guide tubes having a toroidal shaped jewel member secured to one end of each guide tube; said guide tubes being secured to each of said spacing means.

3,882,987

SINGLE ELEMENT TYPE ACTION ARRANGEMENT

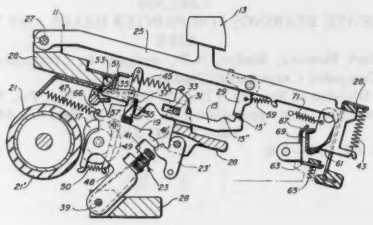
Manfred Link, Nurnberg, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed Feb. 25, 1974, Ser. No. 445,561

Claims priority, application Germany, Mar. 2, 1973, 2310593

Int. Cl. B41j *5/22*

U.S. Cl. 197—16 **7 Claims**



1. In a printer having a single print element with a plurality of different type characters at different positions, the combination comprising:

a plurality of character selection members supported for movement to determine the orientation of the single print element,

a drive lever associated with one of the different type characters on the single print element and having means for engaging and moving selected character selection members,

said drive lever being pivotally supported about an axis for movement from a rest position toward and for effecting movement of said character selection members,

a first resilient biasing means for urging said drive lever toward said rest position and beyond,

a control lever supported for movement about a pivot point and having a portion for normally engaging said drive lever and establishing said rest position thereof,

a second resilient biasing means for urging said control lever toward engagement with said drive lever,

a continuously rotatable power roll,

a drive cam rotatably supported on said drive lever for being cyclically rotatably frictionally driven when engaged with said power roll to move said drive lever toward and to effect movement of said character selection members to a single print element orienting position, to maintain said orienting position for a time to permit printing of a selected character, and to permit return movement of said drive lever toward said rest position, and

keylever means depressible to a first limit position for pivoting said control lever to a release position against the urging of said second resilient biasing means to release and enable movement of said drive lever beyond said rest position under the urging of said first resilient biasing means thereby to bring said drive cam into frictional engagement with said power roll.

3,882,988

MECHANISM FOR BI-DIRECTIONALLY DRIVING A PRINT HEAD

Charles T. Sloan, Cheshire, and Nicholas V. Zaccagnino, Stamford, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 6, 1973, Ser. No. 386,077

Int. Cl. B41j *19/70*

U.S. Cl. 197—66 **21 Claims**

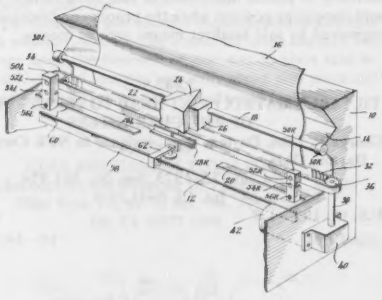
1. In a line printer adapted for printing a material on the fly, a mechanism for bi-directionally driving a print head across a print line with the print head being operated to provide a plurality of successive print strokes in a print line when the print head is driven in at least a first direction, said mechanism comprising:

a bi-directional motor adapted to be continuously energized in one direction for continuously running in one direction and continuously energized in another direction for continuously running in another direction;

means for coupling said motor to said print head, said means for coupling being operative to continuously drive said print head in said first direction when said motor is running in one direction and being operative to continuously drive the print head in the opposite direction when the motor is running in the other direction;

means moved with said print head for controlling each print stroke in accordance with the print head position to apply print to said material while said print head is driven in said first direction;

means operative when a print operation is to be performed for starting said motor running continuously in said one direction to continuously drive said print head in said first direction with said print head operated to provide a plurality of successive print strokes;



first detecting means operated while said print head is driven in said first direction and after said print head is operated to provide a plurality of successive print strokes in a print line for detecting said print head reaching a predetermined point of a print line when said print head is driven in said first direction;

means operated responsive to the operation of said first detecting means for continuously energizing said motor in said other direction to brake said motor and then continuously run said motor in said other direction, while the inertia of the print head carryies said print head a distance in said first direction past said predetermined point before said print head stops and is thereafter continuously driven in said opposite direction by said motor energized in said other direction;

second detecting means operated for detecting said print head reaching another predetermined point on a print line when said print head is driven in said opposite direction; and

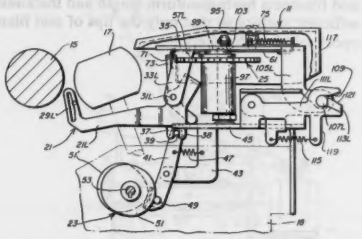
means operated responsive to the operation of said second detecting means for energizing said motor to again run in said one direction for a period of time sufficient to substantially stop said print head.

3,882,989

TYPEWRITER RIBBON LOADING ARRANGEMENT TO FACILITATE REPLACEMENT OR SUBSTITUTION OF RIBBON

Joseph L. Morelli, Hartford, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed Jan. 28, 1974, Ser. No. 436,902
Int. Cl. B41j *33/14*
U.S. Cl. 197—151 **5 Claims**



1. In a business machine having a type element supported on a carriage for impacting against a platen in a printing operation, and a ribbon lifting and feeding arrangement for lifting a ribbon from a lowered rest position to a printing position adjacent the platen prior to the impacting of the type element and for advancing a length of the ribbon past the type element with each printing operation, the improvement comprising:

said ribbon lifting and feeding arrangement including an upper portion serving as a holder for the ribbon and a lower portion mounted fixedly on said carriage for supporting said upper portion in an operating position,

said upper portion having a ribbon lifter movably supported thereon for carrying a portion of the ribbon adjacent the type element for movement between the rest position and the printing position,

said lower portion having a ribbon lifting drive means operably associated with the ribbon lifter of said upper portion in the operating position for driving the ribbon lifter from the lowered rest position to the printing position, and

said upper portion being coupled to said lower portion for guided movement from the operating position adjacent the type element to a generally inverted loading position facilitating the replacement of the ribbon with the ribbon lifter being guided past the type element on the carriage during movement between the operating position and the inverted loading position.

3,882,990

ERROR CORRECTION SYSTEM FOR TYPEWRITERS OR PRINTING DEVICES

Jesus F. Genesio, Alqueirao, Portugal, assignor to Messa-Maquinas de Escrever, S.A.R.L., Mem Martins, Portugal

Filed Feb. 8, 1973, Ser. No. 330,648
Claims priority, application Portugal, May 25, 1972, 57870
Int. Cl. B41j *29/16*
U.S. Cl. 197—181 **8 Claims**

1. In a typewriter for use with ribbons providing a printing field and a print-obliterating field, said typewriter including a printing means comprising a plurality of character keys for printing on paper:

means to support the paper;

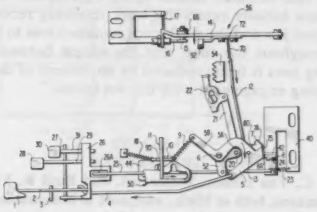
means for normal advancement of said paper support means during the printing operation including an escapement impeller and a space arch operatively connected to said escapement impeller to effect advancement of said paper support means when any of said character keys is depressed;

advancing means for advancing said paper support means independent of said space arch, said advancing means including a space bar operatively connected to said escapement impeller for advancing said paper support means independent of said space arch;

means for positioning a ribbon between said printing means and the paper on said paper support means;

means to select the ribbon field; and

means to backspace said paper support means, the improvement comprising:



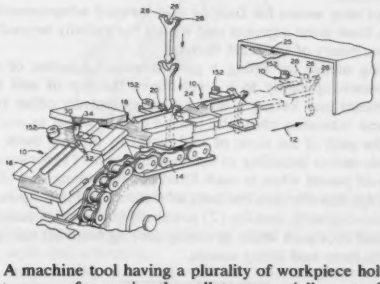
correction means comprising means to simultaneously (1) operate said backspace means, (2) operate said means to select the ribbon field to shift to a print-obliterating field and (3) bypass advancement of said paper support means by preventing operation of said escapement impeller by said space arch and without interference with said means for advancing said paper support means independent of said space arch, so that said paper support means can be moved, by said means for advancing said paper support means independent of said space arch, after engagement of said correction means, while operation of said space arch does not effect operation of said means for normal advancement of said paper support means.

3,882,991

LOADING MECHANISM FOR A MACHINE TOOL

Joseph P. Chayka, Rochester, and David J. Cartner, Royal Oak, both of Mich., assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Jan. 12, 1973, Ser. No. 323,004
Int. Cl. B23q *7/00*
U.S. Cl. 198—19 **3 Claims**



1. A machine tool having a plurality of workpiece holding pallets, means for moving the pallets sequentially past a fixed raw workpiece loading station and past at least one workpiece working position at a controlled substantially constant rate; each of the workpiece holding pallets having a first fixed jaw and a second moveable jaw defining a recess to receive the workpiece; the second jaw being moveable relative to the first jaw in a direction parallel to and opposite the direction of pallet movement; the improvement comprising loading means at the loading station for holding workpieces and adapted for moving a workpiece normal to the direction of movement of

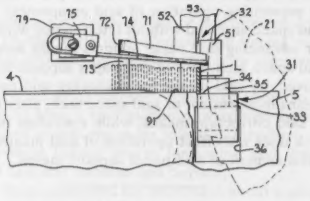
a movement of a pallet; first cam-actuated means responsive to the position of a pallet for causing the loading means to insert a workpiece into the work receiving recess of a pallet while that pallet is passing the loading station; second cam-actuated means responsive to the position of the pallet for moving the second jaw toward the first jaw while the pallet is passing the loading station; the second jaw includes guide means on the face thereof adjacent the first jaw to restrain lateral movement of the workpiece and to properly position the workpiece when clamped between the jaws; the first and second cam-actuated means being coordinated so that the workpiece initially enters the work receiving recess close to the second jaw and the workpiece remains close to the second jaw throughout the time that the recess between the two clamping jaws is being reduced by movement of the pallet to a clamping engagement with the workpiece.

3,882,992

GRID FEEDER

Ronald C. Van Linder, Watervliet, and Basil R. Van Linder, Kalamazoo, both of Mich., assignors to Kalamazoo Manufacturing Company, Kalamazoo, Mich.

Filed Aug. 9, 1973, Ser. No. 387,107
Int. Cl. B65g *47/00*
U.S. Cl. 198—24 **13 Claims**



1. Transfer mechanism for effecting transfer of panels from a position of vertical alignment onto the upwardly moving teeth of continuously rotating toothed transfer wheels, comprising in combination:

conveyor means for supporting said panels in vertical parallel alignment and drive means coupled to said conveyor means for advancing said panels forwardly toward said wheels;

fixed stop means for limiting said forward advancement at a fixed point adjacent said wheels but radially beyond the periphery of the teeth thereof;

lifting means for lifting a predetermined number of said panels upwardly to a level above the top of said stop means and having a lifting edge sidewardly offset from and extending chordally inward of said wheel to overlap the path of the roots of said upwardly moving teeth;

guide means including an upstanding slot for (1) forwarding said panels when in such lifted position along said lifting edge directly into the path of the roots of said upwardly moving teeth, and for (2) positively guiding said panels in said root path while upwardly moving teeth lift said panels from said lifting means.

3,882,993

VIBRATORY BAR FEEDER

Dennis E. Mead, Cupertino, Calif., assignor to Lipe Rollway Corporation, Syracuse, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,380
Int. Cl. B65g *47/00*
U.S. Cl. 198—26 **8 Claims**

1. A vibratory bar feeder for feeding bars axially to a bar working machine, said vibratory bar feeder comprising:

a. a magazine for storing a plurality of said bars;

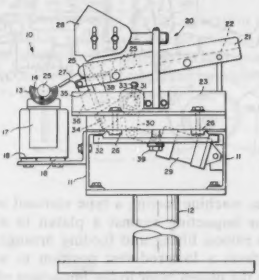
b. means for dropping said bars one at a time from said magazine;

c. a trough below said magazine for receiving said bars dropped from said magazine:

d. said trough having a cylindrical bottom and extending beyond said magazine toward said bar working machine;

e. the inside of said trough being covered with a pile material having flexible filaments uniformly inclined by about 5° – 25° from a vertical transverse plane toward said bar working machine along the length of said trough;

f. said filaments having uniform length and thickness and a sufficient density so that only the tips of said filaments support said bars for feeding;



g. means for vibrating said trough in a generally reciprocal motion in the general direction of the inclination of said filaments;

h. said filaments being sufficiently resilient to flex under said bars during upward movement of said trough in said vibratory motion so said filaments translate said vibratory motion of said trough into feeding speed and force moving said bars toward said bar-working machine;

i. means for sensing the movement of one of said bars out from under said magazine; and

j. means for operating said bar-dropping means in response to said sensing means.

3,882,994

APPARATUS FOR CONVEYING AND ORIENTING AEROSOL VALVES

Karl Mecks, Gau-Odernheim, and Hugo Schindel, Saulheim, both of Germany, assignors to Rationator-Maschinenbau GmbH, Hillesheim, Rheinhessen, Germany

Filed Oct. 26, 1973, Ser. No. 410,294
Claims priority, application Germany, July 14, 1973, 2336001
Int. Cl. B65g *47/24*
U.S. Cl. 198—253 **6 Claims**

1. An apparatus for sorting aerosol valves or closures and the like elongated narrow parts having a head and a bendable long narrow portion extending therefrom, comprising the combination of

1. a funnel-shaped hopper having an open side, the hopper being arranged to receive the parts;

2. an obliquely upwardly extending conveyor band closing the open side,

a. a series of transversely extending entrainment elements mounted on the conveyor band and projecting into the hopper for lengthwise supporting and entraining respective ones of the parts received in the hopper;

b. the conveyor band being movable in an upward direction toward an upper end thereof;

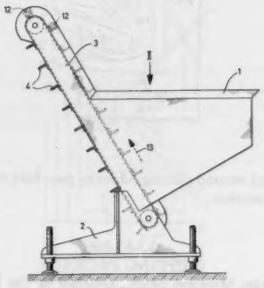
3. another hopper arranged adjacent the upper end of the conveyor band for receiving the parts entrained by the entrainment elements;

4. a gravity tube having an upper and a lower end, the upper end being in communication with the other hopper to

receive the parts therefrom and to convey them to the lower end by gravity; and

5. a vibrating trough in communication with the lower tube end to receive the gravity-conveyed parts therefrom,

a. the depth of the trough corresponding substantially to the length of the long narrow part portions, and



b. a plurality of webs extending longitudinally of the trough and dividing the same into a plurality of elongated compartments, the trough having an inlet end in communication with the gravity tube and a common outlet end into which all of said compartments feed.

3,882,995

BELT CONVEYER

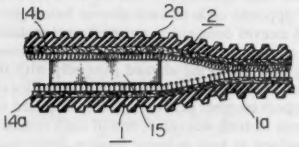
Toru Uraya, Kobe, Japan, assignor to Kanebo Ltd., Japan

Filed Mar. 15, 1973, Ser. No. 341,751

Claims priority, application Japan, Mar. 17, 1972, 47-32775[U]

Int. Cl. B65g *15/14*

U.S. Cl. 198—165 **15 Claims**



1. A belt conveyer for conveying articles along a conveying path having an upright passage, comprising: first and second belts, each having two surfaces; means for guiding and driving said belts along the conveying path, and for guiding them opposite one another in the upright passage; means for admitting articles to the conveying path in variable, relative positions for conveying the articles along the path; interlockable fastener elements substantially covering an entire one of the surfaces of each belt; and means for interlocking said fastener elements of the two belts, about each article admitted to the path, to fix the relative positions of the articles throughout the conveying path, including the upright passage.

3,882,996

VIBRATORY MATERIAL HANDLING APPARATUS

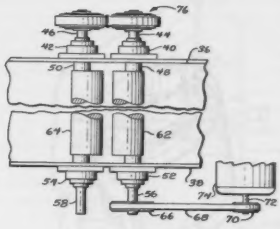
Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Mar. 22, 1973, Ser. No. 343,918

Int. Cl. B65g *27/00*

U.S. Cl. 198—220 DB **6 Claims**

1. In a vibratory material handling device including a material engaging surface adapted to engage material to be handled, and means for vibrating the surface including a pair of rotary shafts each mounting an eccentric weight, a prime mover for rotating one of the shafts, an interconnecting means extending between the shafts whereby when the one shaft is rotated, the other will be rotated in the opposite direction, the improvement wherein said interconnecting means comprises



means for establishing a substantially positive driving connection while allowing limited slippage so that said eccentric weights may synchronize relative to each other to impart a vibratory force to said surface passing through the center of gravity of said apparatus.

3,882,997

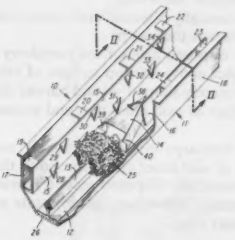
COMBINATION HARPOON-TYPE CONVEYOR AND COOLANT LIQUID TROUGH

Russell D. Dudley, Kalamazoo, Mich., assignor to Prab Conveyors, Inc., Kalamazoo, Mich.

Continuation-in-part of Ser. No. 274,437, July 24, 1972, abandoned. This application May 29, 1973, Ser. No. 364,735

Int. Cl. B65g *25/08*

U.S. Cl. 198—224 **6 Claims**



1. Combination harpoon-type conveyor and coolant liquid trough which comprises

a conveyor trough means having a pair of upstanding side walls and a bottom;

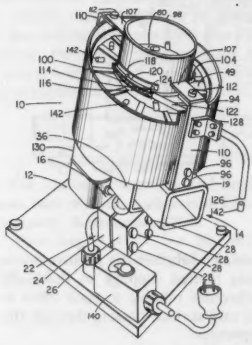
a reciprocating conveying means in said trough means and adapted for reciprocating movement therein; and

a partition member mounted in said trough means alongside at least one of said upstanding side walls, spaced inwardly from said side wall and above said bottom, and extending longitudinally along said side wall for at least a portion thereof, the space intermediate said side wall and said partition member being in communication with the space in said trough along substantially the entire length of said partition member providing unobstructed flow passageways for liquid.

3,882,998
ROTARY FEEDER APPARATUS

George T. Hunter, 512 Avon, Pontiac, Mich. 48053

Filed Sept. 10, 1973, Ser. No. 395,645
Int. Cl. B65g 47/24
U.S. Cl. 198—287 13 Claims



1. A rotary feeder apparatus to orient workpieces for subsequent operations to be performed on them and to feed the workpieces to subsequent work stations, comprising:

a drive shaft rotatably mounted in the apparatus;

an outer disc rotatably mounted in the apparatus, the axis of said outer disc being disposed at a predetermined angle to the longitudinal axis of said drive shaft,

said outer disc being in driving engagement with said drive shaft for rotation therewith;

an inner disc coaxially disposed and connected to said drive shaft for rotation therewith;

a first barrier disposed around the periphery of said outer disc to project above the top surface of said outer disc;

a generally arcuately shaped second barrier disposed above the top surface of said inner disc and eccentric with said inner disc;

a workpiece discharge means operatively associated with the portion of said inner disc disposed to the convex side of said eccentrically disposed second barrier; and

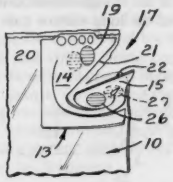
means for rotating said drive shaft to rotate said inner disc and said outer disc.

3,882,999
OPENER/RE-CLOSER FOR SEALED CONTAINERS

Lester R. Wellman, 110 Lakerwood Pl., Highland Park, Ill. 60035

Continuation of Ser. No. 233,037, March 9, 1972, abandoned. This application Oct. 29, 1973, Ser. No. 410,376
Int. Cl. B67b 7/24
U.S. Cl. 206—216 7 Claims

1. In combination, a sealed bag of flexible material, and a cutting device secured inside the bag, said cutting device comprising a first member providing a reaction base adapted to be held in one hand, said first member defining a first cutting edge, a cutting member adapted to be manipulated in the other hand and defining a second cutting edge adjacent said first cutting edge, and hinge means interconnecting said reaction base and said cutting member for permitting relative movement between the two, whereby relative rotation of said cutting member out of the plane of said reaction base causes

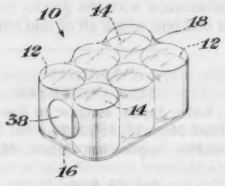


said first and second cutting edges to part said bag material in a shearing motion.

3,883,000
SHIPPING PACKAGE

F. Jack Gibbs, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1972, Ser. No. 234,134
Int. Cl. B65d 65/16, 85/62
U.S. Cl. 206—432 1 Claim



1. A shipping and/or storage receptacle comprising a plurality of hollow and open-ended sleeves of generally uniform height, the opposite ends of such sleeves being generally coplanar, said sleeves comprising a paperboard including a corrugating medium, the longitudinal axis of the waves of said corrugating medium being aligned generally with the axis of said sleeves, an object contained in each such sleeve, respectively, a support member generally flushly disposed against the coplanar ends of such sleeves at one of such opposite ends, a flexible envelope in heat induced tension about such sleeves and support member, and bundling the same together, said objects comprising formed plastic containers filled with product, and wherein such objects rest against such support member, and are recessed within said sleeves.

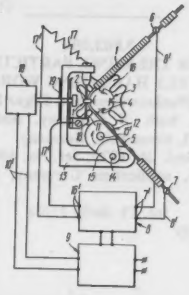
3,883,001
APPARATUS FOR SORTING FERRITE CORES

Jury Alexandrovich Burkin, Tsvetnoi proezd, 29, kv. 24, and Jury Emelyanovich Seleznev, Vesenny proezd, 4-a, kv. 16, both of Novosibirsk, U.S.S.R.

Filed Dec. 5, 1973, Ser. No. 422,070
Claims priority, application U.S.S.R., Dec. 11, 1972, 1855278
Int. Cl. B07c
U.S. Cl. 209—81 A 1 Claim

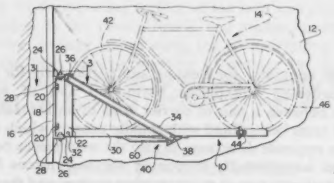
1. An apparatus for sorting ferrite cores comprising a measuring station for testing the electrical parameters of said ferrite cores; means for piece-by-piece feeding of said ferrite cores to said measuring station; an intermittent motion drive of said means for piece-by-piece feeding of said ferrite cores; a tester; contacts of the tester; a two-wire probe extending through each said ferrite core and connected therebehind with said contacts of said tester; separate conductors of said measuring two-wire probe; a circuit conductor which is one of said

separate conductors of said measuring two-wire probe and extends through said means for piece-by-piece feeding of the ferrite cores; said circuit conductor supporting said ferrite cores to be tested and which are strung thereon; a needle of a single-wire probe which is the other conductor of said measuring two-wire probe; said needle of the single-wire probe



being operatively connected to said intermittent motion drive of said means for piece-by-piece feeding of said ferrite cores and electrically coupled to said tester; a sorting unit for said ferrite cores for classifying them into those finished and defective; and electromagnetic means for crushing said defective ferrite core coupled to said sorting unit.

3,883,002
BICYCLE RACK
Myron C. Moore, 700 Tanglewood, Dunedin, Fla. 33520
Filed Jan. 28, 1974, Ser. No. 437,476
Int. Cl. B62h *3/08*
U.S. Cl. 211—18 **6 Claims**



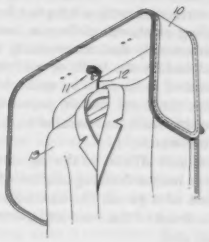
1. A bicycle support comprising, a track for holding the wheels of the bicycle, a support for the track, means mounting an end portion of the track on the track support for generally vertical movement between a storage position and a position inclined downwardly from the track support for moving the bicycle onto and off of the track, means including a member secured to a portion of the track support above the mounting means and to an intermediate portion of the track for engaging a wheel of the bicycle and retaining the bicycle in a generally vertical position on the track, and cooperating latch means on the member and the track releasably holding the track in its storage position.

3,883,003
LUGGAGE CASE HANGER APPARATUS
Clair A. Samhammer, Irvine; David E. Workman, Orange, both of Calif., and Marvin M. King, Denver, Colo., assignors to Samsonite Corporation, Denver, Colo.
Filed May 13, 1974, Ser. No. 469,392
Int. Cl. A45c *13/10*
U.S. Cl. 211—113 **6 Claims**

1. Luggage case hanger mounting apparatus comprising:

a flat metal body formed into a substantial U-shape with first and second parallel legs separated by a curved end wall;

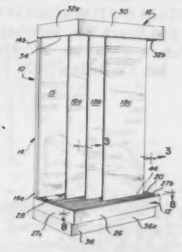
the end portion of the first leg being formed toward the second leg and obstructing only part of the opening between the legs;



the end of the second leg being formed in a direction away from the first leg, said second leg end portion including an opening passing therethrough; and

a finger operated control rotatably mounted onto the U-shaped metal body via parts of the control extending through the second leg end portion opening, said control including other parts formed into a clasp which engages the first leg end portion during a limited extent of the control rotation.

3,883,004
CANTILEVER MOVABLE PANEL DISPLAY RACK
Case J. Slaga, Hinsdale, Ill., assignor to Advertising Metal Display Co., Chicago, Ill.
Filed Jan. 2, 1973, Ser. No. 320,181
Int. Cl. A47f *5/10*
U.S. Cl. 211—162 **9 Claims**



1. A sliding panel display rack of cantilever construction having sliding display panels which are adjustable in front to rear relationship, which comprises:

a. a generally rectangular base having front, rear and side frame elements;

b. vertical wall support means secured to the rear portion of the base at its one lower end;

c. a top frame support member of generally open rectangular configuration having front, rear and side wall elements secured to the top of the supporting wall means in cantilevered relationship thereto and extendng outwardly in spaced overhanging and opposed relationship to said base defining a display space being completely open at the front and sides thereof;

d. track supporting and adjustment means mounted on the inner surface of the top frame side members in parallel opposed relationship to each other and having formed therein a plurality of regularly spaced track receiving and holding means adjustably securing the ends of track elements extending transversely across the space between the side members and associated supporting means;

e. at least one track means which is "C" shaped in cross section in a vertical direction adapted for holding roller means in rolling relationship therein, said track means extending horizontally and transversely across the interior space defined by the walls of said top member and adjustably secured at its ends by said track securing and holding means, the track in said secured position being normal to the side walls and parallel to the front and rear walls of the top frame;

f. a guide means unit affixed to the upper portions of said base, said guide means defining channels for receiving the bottom portion of a panel, the channels being generally parallel to the front of the base and extending across the width thereof; and

g. at least one display panel of generally rectangular configuration having a top, bottom and sides, the dimensions between the sides being less than the side-to-side dimension of the top and base, said panel having at least two rollers mounted adjacent the top edge thereof secured by and within the track elements and carrying the therefrom suspended panel which is confined at its bottom end in the guide means to permit reciprocating lateral movement of the panel on the rollers and within the guide means while maintaining the panel in generally vertically disposed relationship to the base and top frame, said display rack being further characterized by essentially supporting the entire load of the panels by the top frame, rear support wall and base and being open and free from obstructions support, and wall elements at the side and front portions thereof in the space defined by the said top frame, base and joining rear support wall, said construction being further characterized in maintaining the reciprocally movable display panels vertically and parallel to the rear wall within the space defined by the top frame and base.

3,883,005

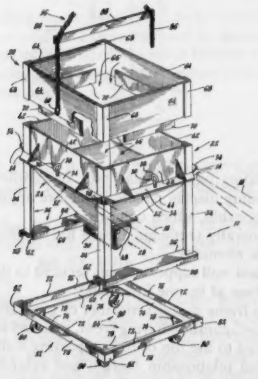
TRANSPORTABLE STORAGE CONTAINERS

Robert K. Stevens, 696 Beach Rd., Fairfield, Conn. 06430

Filed Feb. 8, 1973, Ser. No. 330,710

Int. Cl. B65g *67/02*

U.S. Cl. 214—1 N **13 Claims**



1. In a container of the type used for transportable storage of high volume parts, the improvement comprising: brackets affixed on said container intermediate to the top and bottom thereof each said bracket including a horizontal bearing surface for interfacing with fork lift prongs and means for connecting to an overhead lifting yoke, said horizontal bearing surfaces extending externally from the horizontal extremities of said container perpendicularly to the vertical axis thereof and being disposed on a common horizontal plane through said container.

3,883,006

MACHINE FOR TREATING, PARTICULARLY FOR INDUCTIVELY HARDENING WORKPIECES

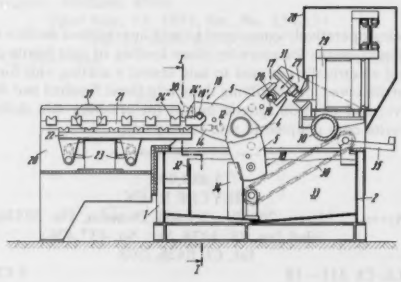
Friedhelm Emde, Huckeswagen, and Edgar Stengel, Wuppertal-Hahnerberg, both of Germany, assignors to AEG-Elotherm GmbH, Remscheid, Germany

Filed Sept. 26, 1973, Ser. No. 400,835

Claims priority, application Germany, Sept. 30, 1972, 2248053

Int. Cl. B65g *25/04*

U.S. Cl. 214—1 BD **1 Claim**



1. In an apparatus for treating and particularly for inductively hardening workpieces having an axis of rotation mounted between a pair of carrier arms of an indexable spider, said arms being fitted with spindle centers which can be moved in opposite directions to grip the workpieces between them and intermittently to convey the workpieces from a loading station to one or more treating stations and then to an unloading station, the improvement comprising

energy storage devices mounted with the centers for urging the same into work gripping position,

actuators at the loading and unloading stations for transferring the centers into their work releasing position,

monitoring means for checking whether a workpiece has been correctly received after loading,

a lifting beam conveyor comprising a stationary beam and a lifting beam for feeding the workpieces in a foreward and rearward direction relative to the loading station, each beam comprising a plurality of workpiece rests, the last workpiece rest on the stationary beam of the lifting beam conveyor aligning with the centers which have arrived at the loading station,

drive means for generating lifting beam motion in both directions and

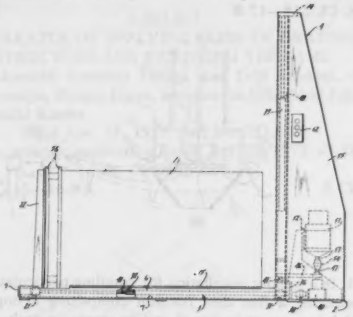
control means responsive to said monitoring means for stopping the lifting beam in a first rest position below the stationary beam, which serves as a starting and end position for a conveying step and in a second rest position above the stationary beam, and for reversing the direction of motion of the drive means at either of the two rest positions of the lifting beam.

3,883,007

MATERIALS HANDLING APPARATUS

Stephen L. Hirschboeck, New London, Wis., assignor to Upenders, Inc., New London, Wis.

Continuation of Ser. No. 163,621, July 19, 1971, abandoned, Continuation-in-part of Ser. No. 16,676, March 5, 1970, abandoned. This application Oct. 3, 1973, Ser. No. 403,100
Int. Cl. B65g 7/00
U.S. Cl. 214—1 Q 5 Claims



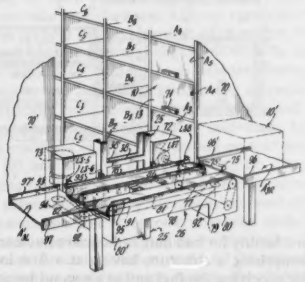
1. In a materials handling apparatus for orienting a load between the horizontal and vertical positions, a generally L-shaped frame having a horizontal and vertical leg, a first track provided on the horizontal leg of said frame, a second track provided on the vertical leg of said frame, a movable generally L-shaped load carrying member having first and second load supporting surfaces disposed generally normal to each other and corresponding to the horizontal and vertical positions for a given load, one of said load supporting surfaces comprising a transversely extending plate member and the other load supporting surface comprising transversely spaced and aligned arms, first carriage means at one end of the first load supporting surface of the load carrying member and guided by the horizontal track, second carriage means at the opposite end of the first load supporting surface of the load carrying member and guided by the vertical track, and means for driving the respective carriage means along the corresponding tracks to move the load carrying member to provide for the desired orientation for a load from the one load supporting surface to the other load supporting surface of said member.

3,883,008

ARTICLE TRANSFER DEVICE

John A. Castaldi, Brooklyn, N.Y., assignor to Supreme Equipment & Systems Corp., Brooklyn, N.Y.

Filed Nov. 15, 1973, Ser. No. 416,286
Int. Cl. B25j 3/00
U.S. Cl. 214—1 BB 13 Claims



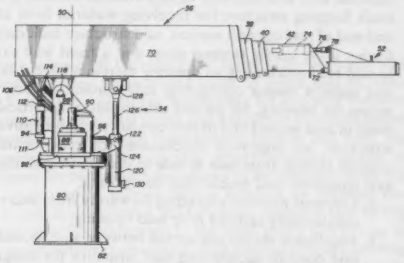
1. Load-handling mechanism for an elevator platform having an elongate rectangular surface to be selectively right-left loaded and unloaded with one of a plurality of containers, said platform including endless-belt conveyor means having an upper horizontal course defining the general plane of said surface and extending longitudinally from end to end of said platform, first reversible-drive means for driving said conveyor means, elongate guide means parallel to the course of said conveyor mean and laterally offset therefrom, a slide slidable in said guide means within the longitudinal confines of said platform and confined to an elevation range beneath said plane, second reversible drive means for positioning said slide along said guide means, container-end engaging means retractably carried by said slide, said container means including an element having a longitudinal lost-motion connection to said slide, actuating means for selectively displacing said end-engaging means between a projected container-engageable position above said plane and a retracted position below said plane, and automatic load-unload cycle-control means including longitudinally arrayed container-presence sensing means and longitudinally arrayed slide-presence sensing means governing belt transport of a container essentially for those positions when a container is at least primarily supported on said conveyor means, said control means further responding to the sensed location and degree of container loading on said conveyor means for governing actuation of said container-engaging means to projected position only (a) when the container is less than primarily supported on said conveyor means and (b) when said slide is in a position longitudinally offset from the container.

3,883,009

RACKING ARM FOR PIPE SECTIONS, DRILL COLLARS, RISER PIPE, AND THE LIKE USED IN WELL DRILLING OPERATIONS

John J. Swoboda, Jr., and Norman L. Swoboda, both of P.O. Box 1939, Victoria, Tex. 77901

Division of Ser. No. 377,321, July 9, 1973, Pat. No. 3,840,128. This application Jan. 17, 1974, Ser. No. 434,199
Int. Cl. E21b 19/02
U.S. Cl. 214—1 B 1 Claim



1. An extendable racker arm assembly comprising:
an extendable boom having a supported end pivotable about a vertical axis and having a free end movable upwardly and downwardly,
pipe gripper means on said free end of said boom for gripping oil well pipe sections,
said boom including an outer housing having first, second and first telescoping sections relatively movable from said housing to extend and retract said boom, the inner of said sections having smaller cross-sections than the outer of said sections,
a first fluid cylinder connected between said outer housing and the upper portion of the first outermost section,
a second fluid cylinder connected between said first and second sections,
a third fluid cylinder connected between said second section and the third innermost section,
control means for sequentially applying fluid to said cylinders to control the outward movement of said telescoping

sections such that said first outermost section is first extended, said second section is next outwardly extended, and said third innermost section is subsequently outwardly extended,

said control means also operative when said boom is fully extended to first retract said third innermost section, then said second section and then said first outermost section in order to provide optimum stability to said boom due to the largest and strongest sections being first extended and last retracted.

3,883,010

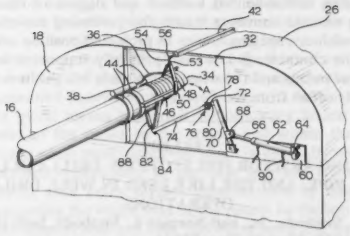
STACK FORMING MECHANISM

Lorne C. Heslop, 52 Debere Dr., Guelph, Ontario, Canada

Filed Apr. 4, 1973, Ser. No. 347,694

Int. Cl. B65g *53/40*

U.S. Cl. 214—9 **5 Claims**



1. For apparatus for building a stack, such apparatus being of the kind including: an elongated conduit section having a first inlet end and a second discharge end; means for blowing material into said first end of said conduit section; a covered stack forming structure for receiving material from said second end of said conduit section, said structure including a roof having downwardly sloping sides, and a front wall extending to said roof and having an opening therein adjacent said roof; and support means connecting said conduit section to said means for blowing, for limited side to side and vertical movement of said second end of said conduit section relative to said structure; an improved mechanism for reciprocating said conduit section from side to side to distribute said material in said structure, said mechanism comprising:

a. a support member extending forwardly from said roof and substantially centred over said opening;

b. suspension means connected between said second end of said conduit section and said structure for hanging said second end of said conduit section from a pivot point above said conduit section, said support means and said suspension means supporting said conduit section with the axis of said conduit section substantially horizontal with said second end discharging in a direction having a substantial horizontal component, and said substantial horizontal component, and said suspension means allowing pivotal movement of said second end of said conduit section from side to side in a substantially circular arc about said pivot point, the ends of said arc being located above the middle of said arc,

c. linkage means for connection to said second end of said conduit section for reciprocating said second end of said conduit section from side to side in said arc,

d. and power means for connection to said linkage means for actuating said linkage means, whereby as said material is blown through said conduit section, some of said material is directed to the upper portions of the sides of said structure to improve the formation of the top of said stack.

3,883,011

HOPPER INSTALLATION

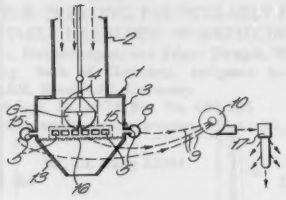
Anthony Robin Pennell, Gravesend, England, assignor to The Associated Portland Cement Manufacturers Limited, London, England

Filed Mar. 14, 1973, Ser. No. 341,062

Claims priority, application United Kingdom, Mar. 14, 1972, 11777/72

Int. Cl. B65g *65/30*

U.S. Cl. 214—17 B **13 Claims**



1. In a hopper installation for handling particulate material containing a fine dust fraction comprising a hopper body which is open at its upper end to receive a grab containing material to be discharged, the hopper having a bottom discharge opening, the improvement in which the hopper body comprises an elongated intake section which is open at its upper end and which is connected at its lower end with and opens into a discharge chamber of increased cross section, said intake section providing an unobstructed passage for introduction therethrough into the chamber of the grab containing material to be discharged, and air extracting means connected to said chambers for withdrawing air from the wall area of said chamber to produce an air flow pattern surrounding a neutral or negative pressure central zone of minimum flow therein within which the grab or bucket can be lowered to release its contents.

3,883,012

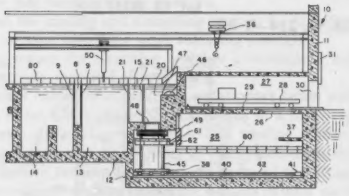
DRY CASK HANDLING SYSTEM FOR SHIPPING NUCLEAR FUEL

Cecil R. Jones, Orange, Conn., assignor to Transfer Systems Incorporated, North Haven, Conn.

Continuation-in-part of Ser. No. 191,247, Oct. 21, 1971, Pat. No. 3,765,549. This application Oct. 9, 1973, Ser. No. 404,434

Int. Cl. B66c *17/00*

U.S. Cl. 214—17 B **9 Claims**



1. In a facility for handling radioactive nuclear fuel elements and comprising a structure having at a first location a fluid pool for receiving the fuel and at a second location a dry area for receiving a shielded shipping cask for transport of the fuel, and connecting the first and second locations a fuel transfer canal and means for flooding the fuel transfer canal whereby

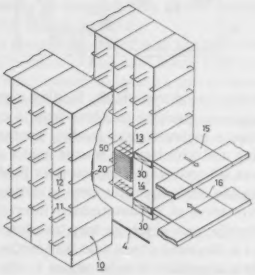
the fuel can be transferred between the locations via the flooded fuel transfer canal while maintaining the cask exterior dry, the improvement comprising a tank sized to receive the cask means for fluid-sealing the cask when within the tank to the tank in such manner that the cask exterior is isolated from the fuel transfer canal, and means for fluid-sealing the tank to the fuel transfer canal when the tank is provided adjacent thereto within the second location.

3,883,013

APPARATUS OF APPLYING SKIDS OF GRATING STRUCTURE AND REMOVING THE SAME

Taro Nakanishi; Katsumi Takagi, and Teiji Ametani, all of Nishinomiya, Hyogo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha

Filed Apr. 16, 1973, Ser. No. 351,608
Claims priority, application Japan, Apr. 19, 1972, 47-38713
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 A **8 Claims**



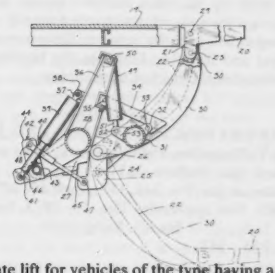
1. Apparatus for receiving, storing and discharging items, such as palletized cargo containers, for example, said apparatus comprising, in combination, a plurality of storage racks aligned in horizontal rows and vertical columns along at least one side of at least one aisle, the racks opening toward the associated aisle and each having a pair of laterally spaced horizontal rails extending perpendicularly to the associated aisle; a plurality of skids each comprising a grated frame constituted by a rectangular grid of rectilinear longitudinal and lateral components defining rectangular openings in the frame; a receiving station and a discharge station at one end of each line of racks, each station being aligned with a respective rows of racks and said stations being spaced vertically from each other, with each station having a pair of laterally spaced horizontal rails extending perpendicularly to the associated aisle; an item receiving conveyor extending to said receiving station; an item discharge conveyor extending from said discharge station; respective fork lift means movable longitudinally of each aisle to transfer items, supported on skids, between said racks and said stations; respective skidders mounted for vertical displacement at each station for movement into and out of horizontal alignment with the respective rails at the associated station, each skidder having a main frame to receive and support a grid, and a secondary frame movable vertically relative to said main frame and carrying rollers movable through openings of said main frame and through the openings in a grid supported on said main frame to engage, lift and support an item resting on the grid supported on said frame; and a skid feeder laterally adjacent said station and extending vertically therebetween, said skid feeder including means operable to receive unloaded skids from the skidder at said discharge station, move the unloaded skids vertically to said receiving station, and feed the unloaded skids onto the skidder at said receiving station; the skidder at said receiving station, prior to delivery of an item thereto on said item receiving container, being raised into horizontal alignment with the rails at the receiving station to receive and support an unloaded skid fed from said skid feeder, and its secondary frame being moved upwardly to project its rollers through the openings of the skid to receive the item from said receiving conveyor, after which the secondary frame is lowered for the item to rest on the grid and the skidder at the receiving station is lowered in its entirety to rest the skid on the rails at the receiving station for removal of the loaded skid from the receiving station by the associated fork lift means; the skidder at said discharge station, upon delivery of a skid-supported item to said discharge station by the associated fork lift means to rest on the rails of said discharge station being raised into alignment with the rails to support the skid and the item, and its secondary frame being moved upwardly to project its rollers upwardly through the openings in the grid to engage and lift the item on the grid for transfer to said discharge conveyor, the secondary frame then being lowered and the unloaded grid being moved from the skidder at the discharge station to said skid feeder.

3,883,014

TAILGATE LIFT MECHANISM

Norman J. Glomski, New Berlin, and Kim K. Jackman, Waukesha, both of Wis., assignors to The Heil Co., Milwaukee, Wis.

Filed Nov. 5, 1973, Ser. No. 413,087
Int. Cl. B60p *1/44*
U.S. Cl. 214—77 P **7 Claims**



1. In a tailgate lift for vehicles of the type having a bed with a tailgate opening for receiving loads, in which said lift has a fixed frame, has a platform, has linkage for movably connecting said platform to said frame and has power-operated means for moving said platform from ground level to bed level, the improving comprising: separate power-operated means on said frame for controlling movement of the platform from bed level to an upright tailgate-closing position, an element pivoted to said fixed frame, a fluid pressure operated ram having one end pivotally connected to the fixed frame and having its other end pivotally connected to said pivoted element to swing the latter, and a connecting element pivoted at one end to said pivotal element and at its other end to said linkage, said connecting element having an intermediate knee pivot which is movable over center with respect to the pivotal connection for said pivoted element and with respect to the pivotal connection with said linkage.

3,883,015

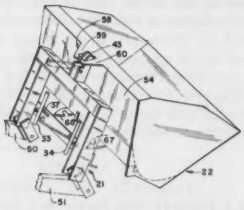
QUICK DETACHABLE BUCKET

Oliver L. Gorby, Fargo, N. Dak., assignor to Dynamic Industries, Inc., Barnesville, Minn.

Filed Aug. 27, 1973, Ser. No. 391,601
Int. Cl. E02f *3/60*
U.S. Cl. 214—145 **2 Claims**

1. A quick detachable bucket for a front end loader having lifting arms and a movable plate member movably mounted on the lifting arms, a loading frame having its lower outer corners pivotally mounted to the outer ends of the lifting arms and its upper portions pivotally mounted to the plate member for movement of the loading frame by the loader, said bucket

having an open mouth at its forward edge and a rear wall, central upper spike means and eyelet means with said spike means receivable in said eyelet means to interengage one another and with one of said means mounted to the central upper edge of said rear wall and the other of said means mounted to the central upper front edge of said frame, said bucket and frame having lower outer hook means and lower outer spring biased rod means comprising two rods pivoted about a horizontal axis, with one of said means mounted to the bucket and the other of said means mounted to the frame and



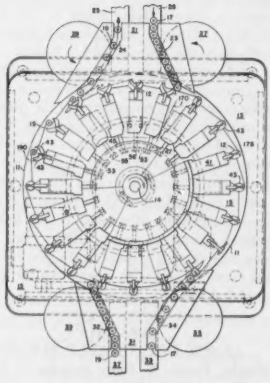
coacting with one another to automatically latch the bucket to the frame upon impact of the lower portion of the bucket to the frame, whereby the spike may be inserted into the eyelet and the frame may lift the bucket upward and rearward to cause the bucket to swing down and impact against the frame to latch the bucket to the bucket to the frame at its lower outer corners by the latch and rod means, camming means acting to cam the rods relative to the frame in opposing directions along a path laterally between the lower outer corners of the bucket and frame to facilitate the latching of the lower outer corners of the bucket to the frame.

3,883,016

ROTARY EXTRACTOR METHOD AND APPARATUS

Anthony V. Simpatico, Palisades Park, N.J., assignor to Avon Products, Inc., Suffern, N.Y.

Division of Ser. No. 242,337, April 10, 1972, Pat. No. 3,797,683. This application Dec. 19, 1973, Ser. No. 425,968
Int. Cl. B65g *65/04*
U.S. Cl. 214—152 **3 Claims**



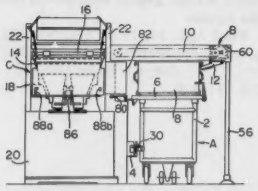
1. A method of extracting a formed pomade from a mold carried on a first conveyor and for positioning the extracted pomade into a conveyor unit on a second and separately moving conveyor for further processing comprising the steps of; passing said pomade and said mold on the first conveyor in a first direction directly onto and then away from a rotating turret, passing said conveyor unit on said second conveyor directly onto and away from the rotating turret in a second direction which is opposite the first direction, grasping said pomade, raising said pomade away from said mold, inverting said pomade, lowering said pomade into said conveyor unit and transporting said pomade for further processing.

3,883,017

APPARATUS FOR AUTOMATICALLY FEEDING CIGARETTES INTO A HOPPER OF A CIGARETTE PACKING MACHINE

Haruji Shirai, Tokyo; Sumio Honda, and Hisasi Kugua, both of Nagareyama, all of Japan, assignors to Tokyo Automatic Machinery Works Ltd., Tokyo, Japan

Filed Aug. 2, 1973, Ser. No. 384,944
Int. Cl. B65g *59/02*
U.S. Cl. 214—302 **9 Claims**



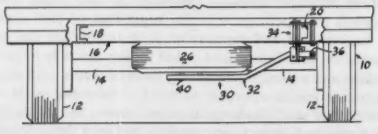
1. An apparatus for automatically feeding cigarettes into a hopper of a cigarette packing machine from a cigarette tray, which comprises a cigarette tray feeding means, a cigarette tray transferring and withdrawing means, and a cigarette tray inverting means, wherein said cigarette tray feeding means is disposed alongside said cigarette tray inverting means and carries cigarette trays at predetermined intervals and feeds them intermittently; said cigarette tray transferring and withdrawing means is disposed above said tray feeding means and reciprocates in a direction at right angles to the direction of the intermittent feeding of said tray feeding means for transferring cigarette trays from said tray feeding means to said tray inverting means and withdrawing them from said tray inverting means and transferring them to said tray feeding means, when said cigarette tray inverting means is at halt; and said cigarette tray inverting means, while holding the cigarette trays, swings between the upright position of said tray, the upright position being defined as the position in which the cigarette trays are transferred and withdrawn and an upside-down position in which the cigarettes in the trays are fed into a hopper, said cigarette tray inverting means includes a inverting plate capable of swinging between the upright position and the upside-down position, a receiver stand having a cigarette tray supporting member and connected to said inverting plate and being vertically movable relative thereto, and a lift means for lifting said receiver stand when the inverting plate is in the upside-down position and causing it to descend when the inverting plate is on the way from the upside-down position to the upright position.

3,883,018

SPARE TIRE CARRIER

Edward C. Hoisington, 2704 Ona, Boise, Idaho 83705

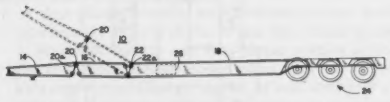
Filed Apr. 29, 1974, Ser. No. 465,386
Int. Cl. B62c *43/00*
U.S. Cl. 214—454 **4 Claims**



1. A spare tire and wheel carrier for vehicles having a rearwardly projecting frame including spaced side members interconnected by spaced cross members, comprising:

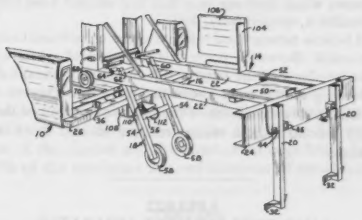
an elongated support arm;
a wheel mounting pad secured to one end portion of said arm; latch means connecting said wheel mounting pad with the frame of a vehicle in wheel and tire stored position,
said latch means including,
an upstanding substantially J-shaped locking hook pivotally connected at its depending end portion with said mounting pad for vertical pivoting movement, and,
a locking bar adapted to be vertically secured at its upper end portion with an under surface of said vehicle,
said locking bar projecting downwardly toward said locking hook,
said locking bar having an aperture in its depending end portion supportably receiving the J-hook shaped end portions of said locking hook; and,
clevis means pivotally connecting the other end portion of said support arm with said vehicle frame, adjacent the periphery thereof, permitting horizontal pivoting movement of said one end portion of said support arm from a tire and wheel stored position to a position outwardly of the periphery of the vehicle,
said clevis means including,
clamp means connected with the rearwardly projecting end portion of one said frame side member,
said clamp means including a pair of plates respectively overlying and underlying the respective upper and lower limits of said frame side member,
said pair of plates cooperatively projecting laterally of said frame side member,
a vertical shaft extending through and rotatably supported by said laterally projecting plate end portions, and,
a clevis secured to the depending end of said shaft and straddling said support arm,
said clevis having a pin forming a bearing for said support arm for vertical pivoting movement of said support arm about the axis of said pin.

3,883,019
POWER ACTUATED FOLDING GOOSE NECK TRAILER
O. Duane Hansen, Jr., Route 3, Canton, S. Dak. 57013
Filed Sept. 4, 1973, Ser. No. 393,674
Int. Cl. B60p *1/04*
U.S. Cl. 214—506 **1 Claim**



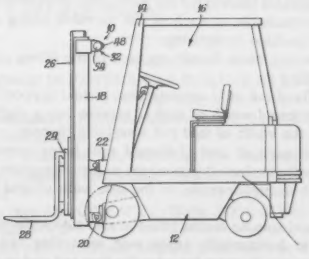
1. A flat bed trailer, comprising:
a. a hitch platform;
b. a flat bed;
c. an intermediate section;
d. means for pivotally joining the rear of the hitch platform to the front of the intermediate section, said means including a first pivot pin adjacent to top surffaces of the hitch platform and the intermediate section;
e. means for pivotally joining the rear of the intermediate section to the front of the flat bed, said means including a second pivot pin adjacent to bottom surfaces of the intermediate section and the flat bed;
f. means for independently locking both joining means in predetermined positions, said locking means including a first pin positioned generally below the first pivot pin, and a second pin positioned generally above the second pivot pin;
g. a first source of mechanical energy interconnected between the hitch platform and the intermediate section for bi-directionally rotating the hitch platform with respect to the intermediate section; and
h. a second source of mechanical energy interconnected between the intermediate section and the flat bed for bi-directionally rotating the intermediate section with respect to the flat bed.

3,883,020
REMOVABLE TRUCK-MOUNTED IMPLEMENT CARRYING FRAME AND METHOD OF LOADING AND UNLOADING SAME
Freddie H. Dehn, 69 Highway, Excelsior Springs, Mo. 64024
Filed Jan. 28, 1974, Ser. No. 437,345
Int. Cl. B60p *1/64*
U.S. Cl. 214—515 **17 Claims**



1. Apparatus for removably mounting an implement on a flat bed of a truck type vehicle normally used for carrying cargo, without interfering with the cargo-carrying capacity of the vehicle, and capable of being installed and removed by a single operator, said apparatus comprising:
a base frame adapted to be moved across and positioned on said bed and coupled to said vehicle for supporting said implement in a working position on the bed;
first stanchion means pivotally coupled with said frame toward the forward end thereof and movable, when said frame has been partially removed from said bed, from a folded position adjacent the frame to a ground engaging position for supporting said frame; and
second stanchion means adapted to be coupled with the frame toward the rear thereof in spaced relationship to said first stanchion means and adapted to engage the ground and operable to raise the rear portion of the frame off the bed in response to movement of the vehicle in one direction to support the frame in said raised position.

3,883,021
FORK LEVEL INDICATOR FOR A LIFT TRUCK
William G. Wilhelm, Painesville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio
Filed Feb. 19, 1974, Ser. No. 443,334
Int. Cl. B65g *47/00*
U.S. Cl. 214—672 **4 Claims**



1. In combination with a vehicle having a mast pivotable relative to the vehicle about a pivot axis, means to pivot said

mast, load carrying means movable upwardly and downwardly on said mast and a device for indicating the levelness of said mast and load carrying means in a plurality of load carrying conditions comprising:

a first body fixed on said mast;

a cylindrical body having its center of gravity spaced from the longitudinal axis of said cylindrical body;

means pivotally interconnecting the cylindrical body and first body so that the cylindrical body is pivotable relative to the first body about the longitudinal axis of said cylindrical body, the cylindrical body being further positioned so that said longitudinal axis of the cylinder is substantially parallel to the pivot axis of the mast;

first and second indicia means fixed relative to the first body to indicate the levelness of said mast and load carrying means when they are in a first and second load carrying condition, respectively; and

third indicia means fixed relative to the cylindrical body and movable therewith upon pivoting thereof, variations in the levelness of the mast and load carrying means due to pivoting of the mast about the pivot axis thereof being indicated by variations of the relative position of the first and second indicia means relative to said third indicia means.

3,883,022

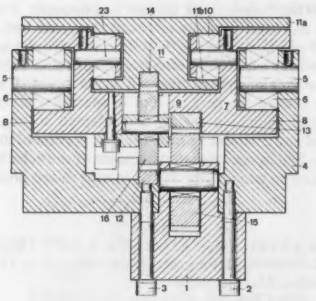
LOAD DISPLACEMENT APPARATUS

Hermann Grebenstein, Erlinsbach, Switzerland, assignor to Oehler-Syhlen-Lagertechnik A.G., Aarau, Switzerland

Continuation of Ser. No. 290,893, Sept. 21, 1972, abandoned. This application May 1, 1974, Ser. No. 465,893

Int. Cl. B66f 9/14

U.S. Cl. 214—750 **1 Claim**



1. A loading attachment adapted for close tolerance table lifting and forklifting movement by movable rails at least partly insertable therein for the movement of pallets to storage which is attachable to each of the movable lifting arms of a stacking machine comprising:

a supporting beam fixedly secured to the lifting arms of the stacker;

a first fixed rail of U cross-section to said supporting beam, the internal width of said U section being slightly wider than the width of said rail insertable therein;

the said walls of said U-shaped rails being provided with inwardly projected extensions to accommodate a spindle which extends parallel to the side walls of said first fixed rail;

roller and spindle means fitted in said side walls of said first rail to horizontally guide said insertable rail which is telescopically movable over the first rail and to also guide a third rail which is telescopically movable over the second rail;

a second U-shaped rail having two outwardly opening side parts each of U-shaped cross-section;

a connecting web bridging said oppositely positioned openings in said second rail;

roller and spindle means fitted in the side parts of said second rail for vertically guiding a third displaceable rail;

a third displaceable rail of I-shaped cross-section having top and bottom surfaces and a connecting web therebetween, the top dimension being greater than the bottom dimension;

said third displaceable rail being mounted for horizontal movement in the side parts of said second rail on the roller and spindle means therein;

said wider surface serving as the load bearing surface to support the pallet being moved while the web of the third rail is dimensioned to correspond to the roller fitted in said second rail;

a rack means rigidly secured to said first rail, said second rail and said third rail and gear wheel means formed of tough fine-finished extruded steel mounted on said supporting beam which meshes with said rack means and with the fixed first rail on one side and the second and third rails on the other side so that the gear wheel means is thereby arranged to laterally displace the rack and extend the second displaceable rail and further extend the third displaceable rail to result in telescopic movement of said second and third rails relative to said first rail;

and, shoulder means on said first, second and third rails for supporting the racks and guide rollers associates therewith said shoulder means being formed of extruded steel for a surface finish which is adapted to close fitting movement for the roller means which is guided and tracked in said rails.

3,883,023

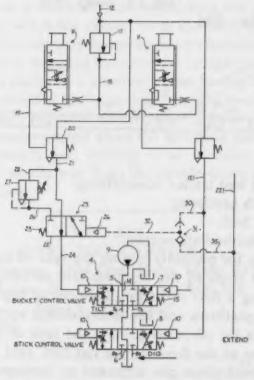
CONTROL MEANS FOR A PAIR OF FLUID MOTORS

Gerald W. Bernhoft, Wauwatosa, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed June 12, 1972, Ser. No. 262,024

Int. Cl. E02f 3/32

U.S. Cl. 214—762 **5 Claims**



1. In a material handling device including a pivotally mounted arm, a tool pivotally mounted on the arm, first and second fluid motor means for independently pivotally moving the arm and the tool, respectively, pump means for directing fluid to the first and second motor means, first valve means movable from a closed to an open position for directing fluid from said pump means to one of said first and second motor means, second valve means movable from a closed to an open

position for directing fluid from said pump means to the other of said first and second motor means and manual actuator means for each of said first and second valve means; the improvement comprising: control means, including a separate source of fluid pressure and pressure operated means communicating with said separate source for moving said first and second valve means between open and closed positions, operatively connected between said first and second valve means for moving said first valve means to a partially closed position in response to opening of said second valve means whereby said arm and said tool are pivoted simultaneously at a reduced speed.

3,883,024

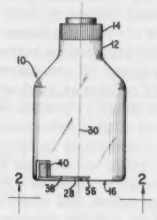
DISPENSER COMBINED WITH HANGING CLIP FOR INVERTED SUPPORT

Douglas W. Thomas, Toms River, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,796

Int. Cl. B65d *23/12*

U.S. Cl. 215—100 **7 Claims**



1. An assembly for supporting a container in an inverted position comprising:

A. A container having a discharge orifice at one end and an end wall at the opposite end;

1. A recess defined in said end wall;

2. Means on said end wall to support a hanger device located in the said recess section off center of the vertical axis of said container;

B. A hanger device rotatably connected to said support means and further comprising:

1. A first planar portion, and a second planar portion substantially at right angles to said first planar portion;

2. Means defined in said first planar portion adjacent the end opposite said second planar portion to rotatably connect said hanger device to said container support means whereby said hanger rotates in the plane of said first planar portion;

3. The length of said first planar portion from said connecting means to said second portion being greater than the distance from said connecting means to the most distant portion of said end wall.

3,883,025

GASKETS FOR CONTAINER CLOSURES

John Adrian Lancaster Jemmett, Ilfracombe, Devon, England, assignor to W. R. Grace & Co., Cambridge, Mass.

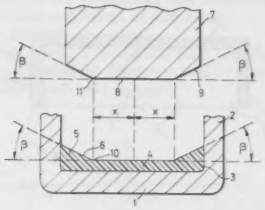
Filed Apr. 3, 1974, Ser. No. 457,690

Claims priority, application United Kingdom, Apr. 12, 1973, 17646/73

Int. Cl. B65d *53/00*

U.S. Cl. 215—341 **11 Claims**

1. In a container closure, suitable for a container having a threaded neck, said closure having a top portion, an integral skirt which extends downwardly from the top portion and is adapted to be secured on the container by threads complementary to said threads on the container neck and a gasket within the closure which, considered in its configuration before the closure is closed onto the container, has a substantially flat central panel and a peripheral portion adjoining said panel at an adjoinment edge, the improvement which comprises a said peripheral portion having a thickness which is at all points greater than the thickness of the central panel and



increases continuously, stepwise, or part-continuously and part-stepwise, radially outwards from the adjoinment point to the skirt of the closure, the radial length (x) between the centre of the closure and the adjoinment edge being from 25 to 45% of the maximum internal diameter of the closure (d).

3,883,026

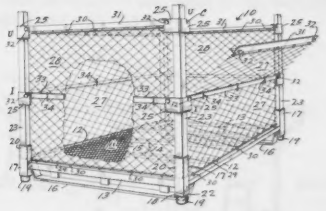
COLLAPSIBLE WALL CONTAINER

John C. Selz, 2628 Middlesex Dr., Toledo, Ohio 43606

Filed Apr. 23, 1973, Ser. No. 353,398

Int. Cl. B65d *7/24*

U.S. Cl. 220—6 **6 Claims**



1. A container comprising a floor, support members connected to said floor, vertical posts removably received by said support members, a resilient wall member having a first lower edge connected adjacent a periphery of said floor, said wall member being vertically stretchable from a first, non-stressed condition to a second, stressed condition, catch means connected adjacent a second upper edge of said wall members and means on each of said posts for receiving said catch means only when said wall member is stretched to the second stressed condition; whereby said wall member urges said catch means within said receiving means to resiliently lock said wall member in an upright position.

3,883,027

CONTAINER IN PARTICULAR FOR USE AS BATHROOM CABINET

Walter Schneider, Wildenbuhlstr. 54, CH 8135 Langnau am Albis, Switzerland

Filed Oct. 11, 1973, Ser. No. 405,566

Claims priority, application Switzerland, Oct. 26, 1972, 15780/72

Int. Cl. A47b *67/02*; **B65d** *25/36*, *25/14*

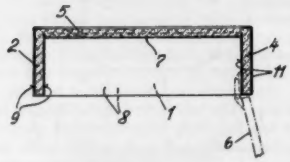
U.S. Cl. 220—9 F **4 Claims**

1. A box-like container adapted to be used as a bathroom cabinet comprising:

a one-piece molded hard-foam plastic core of rectangular outline and a back wall portion with four side wall por-

tions contiguous with one another and projecting forwardly from said back wall portion;

a sheet metal member overlying the innerface of said back wall portion and reaching substantially to said side wall portions around its periphery;



substantially U-profile sheet metal side wall members pushed onto said side wall portions and having inner legs reaching to said back wall member, webs overlying the forward edges of said side wall portions, outer legs flanking said side wall portions and reaching to the rear face of said back wall portion, and inwardly turned flanges overlying and engaging said rear face.

3,883,028

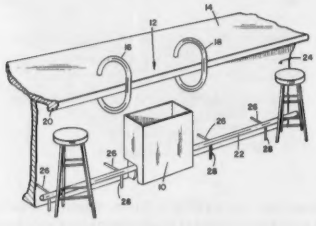
TRASH RECEPTACLE

John A. Kittelson, 1970 Filbert, San Francisco, Calif. 94123

Filed Feb. 22, 1974, Ser. No. 444,632

Int. Cl. B65d *25/24*

U.S. Cl. 220—18 **8 Claims**



1. A trash receptacle placeable at the front face of a bar or similar counter having a foot rail, said foot rail being mounted to the front face of the bar by means of support struts projecting from the bar and connected to the foot rail, said receptacle comprising a chamber having a downwardly closed base portion adapted to override the foot rail and an upwardly open body portion extending upwardly from said base portion, said base portion including a forward section depending from the body portion and adapted to abut the floor on the front side of the foot rail opposite from the front face of the bar, a central downwardly concave section adapted to overlie the foot rail and a rear section comprising at least one pair of narrow depending segments at least one of which is adapted to abut the floor between the front face of the counter and the foot rail, said pair of depending segments defining a space therebetween adapted to receive one of the support struts therein so that said chamber can be placed over the foot rail with both the forward section and the aft section of the base portion in abutment with the floor to provide a solid support for said chamber, one of the support struts being engaged between the depending segments of the rear section of the base portion of the chamber so that transverse movement of the chamber is prevented.

3,883,029

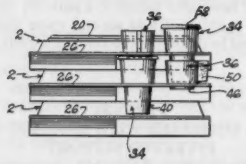
STACKABLE TRAYS AND CUPS

William B. Wyatt, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Filed Nov. 30, 1972, Ser. No. 310,684

Int. Cl. B65d *1/34;* **A47g** *19/00*

U.S. Cl. 220—23.83 **1 Claim**



1. A food service system comprising a stack of trays, each tray having a central portion and a ledge extending from said central portion and having upper and lower surfaces, said ledges being spaced vertically from each other, each ledge having a pair of holes formed therein to form two vertical columns of such holes, a pair of vertical columns of containers carried on said ledges and having portions extending through said holes, each vertical column of containers comprising alternating first relatively tall containers, each with a supporting surface intermediate its length in contact with an upper surface of a ledge, and second relatively short containers, each with a supporting surface intermediate its length in contact with an upper surface of a ledge, and wherein the portion of a first container below a ledge is disposed within a second container carried on a ledge below, and wherein the portion of a second container below a ledge extends only slightly below that ledge out of contact with a first container on a ledge below.

3,883,030

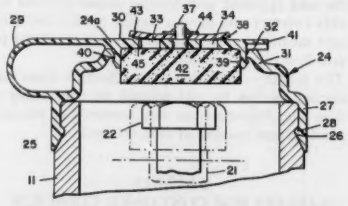
BREATHER CAP APPARATUS FOR A SPRING-ACTUATED BRAKE MECHANISM

George P. Mathews, 16947 Kinross Rd., Birmingham, Mich. 48009, and Robert B. Hutter, 14180 Susanna, Livonia, Mich. 48154

Continuation-in-part of Ser. No. 179,843, Sept. 13, 1971. This application Jan. 15, 1973, Ser. No. 323,517

Int. Cl. B65d *51/16;* **F16k** *17/00*

U.S. Cl. 220—204 **15 Claims**



1. Breather cap apparatus for closing off from the atmosphere the spring chamber of a brake mechanism comprising:

a cap member comprised of a ring-shaped portion and a disc-shaped portion integrally connected;

said ring-shaped portion including airtight means thereon for connecting said member to said spring chamber;

said disc-shaped portion including leakproof means thereon for coupling said disc-shaped portion to said ring-shaped portion in a manner selectively sealing off the interior of said spring chamber from the atmosphere;

air flow means associated with said disc-shaped portion for permitting free breathing in one air flow direction, from

the interior of said spring chamber to said atmosphere, said air flow means including a plurality of spaced apertures in said disc-shaped portion and a resilient valve operatively connected to said disc-shaped portion, said valve closing off said apertures when seated in position on said disc-shaped portion, said disc-shaped portion including a raised, beaded ring thereon outside of said spaced apertures with said valve being sprung against said beaded ring to thereby be in a normally closed position; and

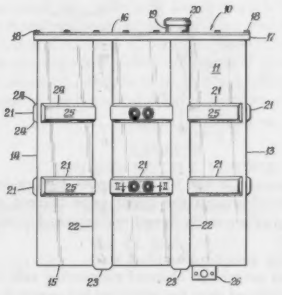
said valve including means thereon at least at the point of contact with said beaded ring to prevent a perfect airtight seal between said beaded ring and said valve and permit a selectively controlled amount of air leakage therepast.

3,883,031

HYDRAULIC TANK WITH WALL STRESSING MEANS

William D. McMillan, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 19, 1974, Ser. No. 462,333
Int. Cl. B65d *7/44*
U.S. Cl. 220—71 **7 Claims**



1. In a tank for a heavy duty hydraulic system which may produce pressure variations within the tank, said tank having generally parallel major walls connected by side walls and a bottom wall, an open top, and a removable closure for the open top, and wall stiffeners bonded to at least the major walls, adjustable wall stressing means comprising, in combination:

a pair of mounting members secured to opposed areas on the inner surfaces of the major walls, said mounting members having aligned facing bores and being manually accessible through the open top of the tank;

a tie rod which has its end portions rotatably interengaged within said bores;

and screw thread means functionally related to said tie rod so that rotation of the tie rod in one direction moves said major walls apart at the mounting members and rotation of the tie rod in the opposite direction draws the major walls toward one another at said mounting members through the interengagement of the tie rod in the bores.

3,883,032

AUTOMATIC DRAIN VALVE FOR A FLOATING ROOF

Walter Fisher, Willowdale, Ontario, Canada, assignor to Texaco Canada Limited, Montreal, Canada

Filed Apr. 22, 1974, Ser. No. 462,913
Int. Cl. B65d *87/18*
U.S. Cl. 220—219 **1 Claim**

1. In combination with a buoyancy-type floating roof for an atmospheric liquid storage tank, an automatic drain comprising

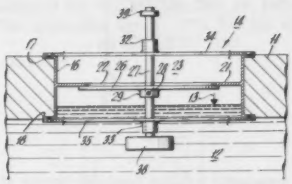
a circular housing mounted integrally flush with the top and bottom surfaces of said roof,

said housing incorporating an integral flat partition located midway relative to the thickness of said roof and having a cylindrical walled circular orifice coaxially located therein, and

a closure member for maintaining said orifice closed under normal floating conditions of said roof,

said closure member comprising

a thin flat disk having a cylindrical edge with the diameter thereof greater than the diameter of said orifice and being located underneath said partition,



a vertically situated shaft under normal floating conditions of said roof and having said flat disk attached centrally thereon,

a pair of diametrically located relatively narrow strips having bearings centrally attached thereto for slidably supporting said shaft and disk for free vertical movement, and

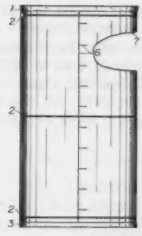
a float attached to the bottom of said shaft situated below the lower one of said strips and having sufficient buoyancy when immersed in said liquid to bias said disk into closing contact with said partition.

3,883,033

INSTANT TWISTOPEN CAN

Roland Clough Brown, 425 Stratford Ct., Del Mar, Calif. 92014

Filed Mar. 15, 1974, Ser. No. 451,420
Int. Cl. B65d *41/32*
U.S. Cl. 220—266 **12 Claims**



1. An improvement on a fabricated metal container for product contents, consisting of a formed center part of length desired and of geometrically-shaped cross-section, fitted with a top and a bottom captive cover part means to match the cross-section of the said center part, crimped onto the center part at each end, said center part with scored mark means at points desired around its outer surface to weaken the section of the said metal thickness below the scoring for easy breaking under torsional stress from twisting action by the user between the upper and lower portions of the said container, just above and below a selected score mark, thus opening the said container and allowing access to its said contents, all without the assistance of any accessory device by the user except the said container itself.

3,883,034
NON-RETURNABLE PACKING CONTAINERS

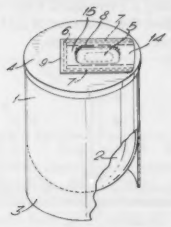
Anders Ruben Rausing, Via Kenia 22-24, Rome, Italy

Filed Sept. 13, 1973, Ser. No. 396,726

Claims priority, application Switzerland, Oct. 18, 1972, 15198/72

Int. Cl. B65d *41/32, 41/00*

U.S. Cl. 220—268 **3 Claims**



1. A non-returnable packing container having at least one substantially plane end wall, a pouring opening provided in said end wall, an inner cover strip affixed to the inside of said end wall to cover the pouring opening, a longitudinal outer cover strip disposed over the pouring opening against the outside of said end wall, said outer cover strip being affixed to said inner cover strip in the area of the pouring opening by a strong seal joint, said outer cover strip being affixed to the outside of said end wall along longitudinal sealing zones on opposed sides of and spaced from the edge of the pouring opening, said outer cover strip having two substantially parallel lines of perforations located on opposed sides of the pouring opening between the edge of the pouring opening and said longitudinal sealing zones, said longitudinal outer cover strip being affixed by a strong seal joint at one end thereof to said end wall along a sealing zone which extends transversely of the lines of perforation, whereby said outer cover strip will normally remain affixed to said end wall after opening the packing container by lifting said outer cover strip and tearing along said lines of perforation to remove the inner cover strip in the area of the pouring opening.

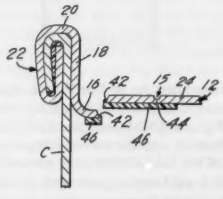
3,883,035
EASY OPENING CONTAINER WITH SAFETY EDGE COMPOUNDS

Kenneth Richard Rentmeester, Barrington, and Joseph Lambert Godar, Jr., Wauconda, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Sept. 19, 1973, Ser. No. 399,123

Int. Cl. B65d *41/32*

U.S. Cl. 220—270 **18 Claims**



1. In a metal container wherein a full-open end closure is seamed to a container body, wherein the end closure includes a peripheral countersink wall, full-open removable central panel defined by a substantially peripheral score line and an opening tab secured to the central panel and operative upon manipulation to cause a rupture in the score to leave a rim between the countersink wall and the score, the improvement which comprises:

a safety edge compound having sufficient elongation, tear and tensile characteristics to tear without substantial fragmenting or stringing upon removal of the central panel derived from a composition comprising from about 5 to about 30 percent of an elastomeric polymer, liquid vehicle and from about 95 to 70 percent filler, said compound covering the score and tearing to protect the metal edges of the removable panel section and the rim upon rupture of the score.

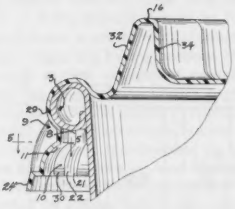
3,883,036
SNAP-ON LID

John W. Mahaffy, Three Rivers, Mich., and Herm L. Haven, Atlanta, Ga., assignors to Continental Can Company, Inc., New York, N.Y.

Filed May 4, 1973, Ser. No. 357,423

Int. Cl. B65d *43/10, 21/02, 41/18*

U.S. Cl. 220—306 **17 Claims**



1. A snap-over cover for containers having an external peripheral bead around the upper edge thereof, said cover being formed of an easily flexed material and comprising:

a top wall;

a depending peripheral conical skirt;

an inverted peripheral channel connecting said top wall to said peripheral skirt for receiving the external peripheral bead formation of a container;

an arcuate in cross section bead intermediate said top wall and said channel and having an inner edge and an outer edge;

a plurality of circumferentially spaced inwardly directed projections formed in said skirt and adapted to form a waist to underlie the peripheral bead of a container to retain the cover thereon and form spring pressed detent means; and

an inwardly facing arcuate land below each projection extending normal to said channel and shaped to provide a camming surface when forcing the cover onto a container and to matingly fit onto the outer side of the channel of another cover stacked in nested relation therewith to prevent lateral movement between nested covers.

3,883,037
DISPLAY UNIT

Pierre Francois Xavier Seiller, Ain, France, assignor to Societe a Responsabilite Limitee dite: Le Presentoir Seiller, Ain, France

Filed Mar. 28, 1973, Ser. No. 345,723

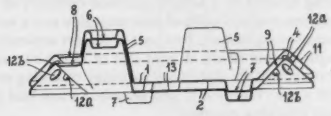
Claims priority, application France, Mar. 30, 1972, 72.11995; Feb. 7, 1973, 73.05078

Int. Cl. B65d *21/04*

U.S. Cl. 206—5 **6 Claims**

1. A display unit for articles to be mounted along its periphery, comprising a stack of identical thin-wall members of circular outline and provided with a pluarlity of angularly equispaced formations projecting from one axial side of each member and forming concavities at the opposite axial side

thereof, said formations of pairs of adjacent members nesting in one relative angular position of the adjacent members with a projecting side of each formation of one member of the pair fitting into the concavity of a respective formation of the other member of the pair, the formations of the adjacent members of the pair spacing said members apart in another relative angular position to expand the stack, said members each being provided along its periphery with means for mounting said articles thereon, said formations including three angularly equispaced bosses, each member being of disk shape and further formed with three angularly equispaced recessed portions projecting from the said other side of the member, each boss being located between two recessed portions and at the same angular distance from each of them, each boss being formed at its upper end with a cup capable of receiving one such recessed portion, the cups of said bosses and said recessed portions having their centers located on a common circle centered on the axis of the disk such that when two adjacent members have the same angular position, the bosses of one fit into the bosses of the other and, when the adjacent members are angularly offset through one sixth of a revolution, the recessed portions of an upper member are received in the cups of the bosses of a lower member of the pair.

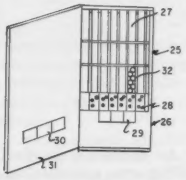


3,883,038

CAN AND BOTTLE VENDOR

Floyd V. Bookout, Long Grove, Ill., assignor to Rock-Ola Manufacturing Corporation, Chicago, Ill.

Filed Nov. 12, 1973, Ser. No. 414,752
Int. Cl. B65g *59/00*
U.S. Cl. 221—67 **12 Claims**



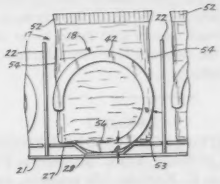
11. In an automatic coin controlled vending machine for dispensing canned or bottled articles from vertical open bottom magazines in which articles are stored in serpentine stacks, improved dispensing means comprising: an upper vend gate assembly mounted in blocking position over the open bottom of said magazine and comprising a pair of horizontal rod means positioned to underengage the bottommost article of a stack thereover, a lower vend gate assembly mounted horizontally beneath said upper assembly to define an article receiving escrow chamber therebetween, means effecting alternate periodic oscillating movement of each said rod means relative to the other along a path about the upper end of said chamber and non-interferingly with the interior thereof such that the resulting separation of said rod means permits the passage of a said bottommost article therebetween for entry into said chamber; said lower assembly comprising gate means pivotal about a horizontal axis for movement toward and away from said rod means and sequentially to and between a raised position adjacent said rod means whereat the same underengages and supports said bottommost article as it enters said chamber, an intermediate position to which it carries and at which the same holds said article in said chamber, and a lowered position whereat articles thereon are released from said chamber; and means sequentially operating said rod and gate means to effect movement of said gate means from said raised to said intermediate position for each cycle of oscillating movement of said rod means and subsequent movement thereof to said lowered position.

3,883,039

VENDING MACHINE FLAT HELIX DISCHARGE UNIT

Francis A. Wittern, Des Moines; Henry J. Albright, West Des Moines, and Arthur N. Wirstlin, Altoona, all of Iowa, assignors to Fawn Engineering Co., Des Moines, Iowa

Continuation of Ser. No. 326,780, Jan. 26, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 456,742
Int. Cl. G07f *11/36*
U.S. Cl. 221—75 **1 Claim**



1. In a vending machine having a cabinet and within one portion of which is mounted an item discharge chute for dispensing items in flexible packages to be withdrawn from the machine, a plurality of item discharge units mounted in a side-by-side, horizontally disposed arrangement, each item discharge unit comprising:

tray means having a base, laterally spaced side walls, a rear end, and a front end open to the discharge chute, said tray means adapted to hold a plurality of flexibly wrapped items, said base having a depression formed laterally centrally thereof and extended longitudinally thereof;

helical means including a helix having a plurality of convolutions disposed within and extended longitudinally of said tray means, each of said convolutions nested within said depression in sliding contact with a bottom portion of said depression, each convolution portion having a radial thickness equal to the depth of said depression whereby the bottom of an item is supported at each end by said base and intermediate said ends by a convolution portion, thereby extending substantially level across said base and above said depression; and

customer controlled drive means at said rear end connected to for rotating said helix a pre-determined incremental amount.

3,883,040

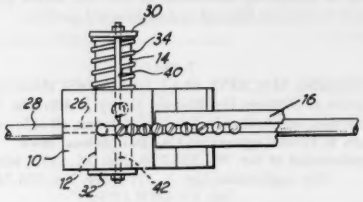
PNEUMATICALLY OPERABLE GATING MECHANISM

Peter Martin Bell, 83 Queens Rd., Cheadle Hulme, Stockport, Cheshire, England

Continuation of Ser. No. 198,694, Nov. 15, 1971, abandoned. This application Oct. 25, 1973, Ser. No. 409,765
Claims priority, application United Kingdom, Nov. 14, 1970, 54298/70
Int. Cl. B65h *5/22*
U.S. Cl. 221—224 **2 Claims**

1. A pneumatically operable feed and gating mechanism for items having a head portion and a shank portion, comprising a spool valve movable between two positions in response to pneumatic pressure, a supply line for feeding said items to be gated to the mechanism, a delivery line spaced from said supply line along the axis of said spool valve through which said gated itmes are delivered from the mechanism, an air feed line, the spool valve being constructed with axially spaced

ports such that in one position one of said ports connects the air feed line to the delivery line and such that in the other position the other of said ports containing one of said items is connected to the delivery line and the air feed line is closed, and a gating mechanism movable with said spool valve and



comprising coaxially aligned rods extending from each end of said spool and defining an inclined slot between the free ends of said rods to permit one of said items to be delivered from the supply line to the delivery line when the spool valve moves into said other position.

3,883,041

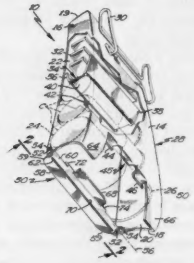
AMMUNITION CARTRIDGE DISPENSER

Gordon G. Olson, Willmar, Minn., assignor to Floyd B. Olson, Pennock and Les R. Karjala, Minneapolis, both of, Minn., part interest to each

Filed Jan. 17, 1974, Ser. No. 434,250

Int. Cl. B65h *1/08*

U.S. Cl. 221—227 **6 Claims**



1. An ammunition cartridge dispenser comprising:

a magazine including front and rear panels interconnected by upright end walls to define an interior chamber therebetween in which a plurality of cartridges is storable and further including a cartridge aperture at an open end of said chamber and communicating with said chamber, through which cartridges are loadable into and dispensable from said chamber;

a spring-loaded foot mounted within said chamber for movement toward and away from said cartridge aperture and biased to move toward said cartridge aperture to urge cartridges storable in said chamber toward said aperture; said magazine further including stationary cartridge retaining means on said rear panel and adjacent said cartridge aperture to contact a cartridge containable within said chamber to aid in retaining the cartridge within said chamber;

a movable dispensing lever adjacent said cartridge aperture, confronting said stationary cartridge retaining means and pivotally connected to said magazine to pivot about a longitudinal axis oriented generally parallel to said front panel, said lever including a handle extending out of said magazine so as to be accessible to an operator and further including a cartridge engaging arm;

said dispensing lever being swingable between retaining position wherein said cartridge engaging arm of said lever cooperates with said stationary cartridge retaining means to releasably retain a cartridge within said chamber and a releasing position wherein said cartridge engaging arm swings away from said stationary cartridge retaining means to increase the spacing therebetween to permit a cartridge to leave said chamber and pass therebetween toward said cartridge aperture in response to force from said spring biased foot transmittable to the cartridge and directed toward said aperture; and

said cartridge engaging arm being bifurcated, a first bifurcation being defined by a hand positioned centrally on said arm between said end walls of said magazine and a second bifurcation being defined by a pair of fingers separated by the length of said hand, at least one of said bifurcations cooperating with the stationary cartridge retaining means to retain a cartridge within said chamber when said lever is in said retaining position.

3,883,042

INSTALLATION FOR DISPENSING GASOLINE

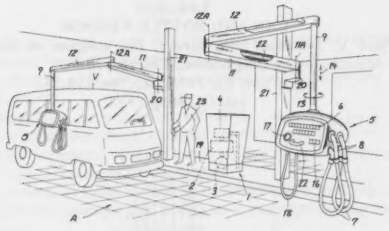
Heinrich Junker, Schwelm, Germany, assignor to Grundstückverwaltungsgesellschaft Muller & Co. KG, Schwelm, Germany

Filed Aug. 22, 1973, Ser. No. 390,601

Claims priority, application Germany, Aug. 24, 1972, 2241556

Int. Cl. B67d *5/06*

U.S. Cl. 222—23 **3 Claims**



1. An installation for dispensing gasoline or the like to a motor vehicle at a filling area, said installation comprising:

an overhead support at said area;

a displaceable dispensing head provided with a price indicator, a filler hose, and value means for controlling gasoline flow through said hose;

support means suspending said head from said support for horizontal movement of said head jointly with said indicator, hose, and valve means in all horizontal directions throughout said area;

means for vertical movement of said head relative to said support;

means for rotation of said head about a vertical axis;

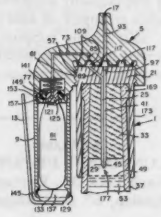
a stationary pump remote from said head for drawing gasoline out of a supply thereof;

conduit means extending between said pump and said head for supplying said gasoline to said head, said support means including at least two arms, one of said arms being pivoted on said support and the other arm being pivoted on said one arm and carrying said head, and switch means on said head and connected to said pump for sensing the proximity of a motor vehicle to said head and allowing dispensing of gasoline only when a vehicle is adjacent said head.

3,883,043
DISPENSOR FOR VINTAGE WINES

Charles Robert Lane, Box 399, Los Altos, Calif. 94022

Filed Oct. 18, 1973, Ser. No. 407,552
Int. Cl. B67b 7/24
U.S. Cl. 222—82 9 Claims



1. A device useful for dispensing a liquid from a sealed bottle without unduly agitating the liquid contained in the bottle while maintaining a desired gas in contact with the liquid to the exclusion of undesired vapors, the device being operable to dispense liquid, comprising:

A. A seal traversing body separately attachable over the neck of the sealed bottle, comprising:

a cap adapted to fit over and encompass the neck of the sealed bottle; means for piercing through the seal of the bottle, said piercing means including a tube and a pipe each extending through said cap, one end of said tube and one end of said pipe extending beyond the bottom of the cap, said one end of said tube and said one end of said pipe being insertable through the seal of the bottle, said one end being adapted to terminate within the bottle and each terminating above the normal liquid level therein, said tube being adapted to introduce a flow of gas into the bottle and said pipe adapted to conduct

a flow of liquid from within the sealed bottle through the seal of the bottle and through the cap to the outside of the bottle;

in combination with:

B. a liquid delivery member sealable in a readily attachable and detachable manner by a twisting motion in aligned and abutting relation to said cap after said seal traversing body is attached over the neck of said sealed bottle, said member comprising:

a second body having a cavity adapted to hold a gas filled pressurized vessel, said second body having a passage therethrough establishing a sealed gas flow connection at one end of said passage with said vessel and aligned at the other end of said passage through 360° of rotation of said member relative to said body with said other end of said tube, said second body also having an outlet tunnel therethrough aligned to establish liquid flow connection through 360° rotation of said member relative to said seal traversing body from the other end of said pipe to the exterior of said bottle; and

a flow control valve communicating the interior of said vessel with said passage.

3,883,044
MICROPIPETTER, ESPECIALLY FOR THE DISCHARGE OF A SAMPLE AND A DILUENT

Joseph Buchler, Fort Lee; Otto Gross, Bergenfield, both of N.J., and Bernard Parker, Westport, Conn., assignors to Buchler Instruments Division Nuclear-Chicago, N.J.

Filed Mar. 30, 1973, Ser. No. 346,637
Int. Cl. G01f 11/06
U.S. Cl. 222—309 15 Claims

1. A pipetter comprising:

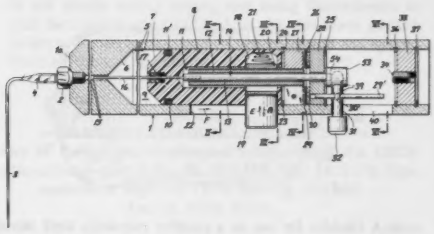
a housing having a port and defining a compartment communicating with said port;

a first piston shiftable in said housing for varying the volume of said compartment;

a second piston shiftable in said housing for varying the volume of said compartment independently of said first piston;

actuating means movable relatively to said housing and operatively connected to said second piston for displacing same relative to said housing; and

mechanism operatively connecting said first piston to said actuating means for incremental displacement of said first

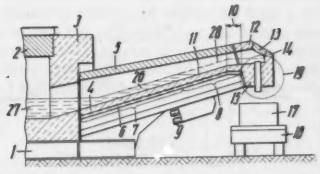


piston subsequent to displacement of said second piston whereby discharge of a sample by movement of said second piston is followed by incremental discharge of a quantity of liquid from said compartment by said first piston, said housing being a barrel forming a cylinder defining said compartment at one end, said first piston being axially shiftable in said cylinder and said second piston is axially shiftable in said first piston, said actuating means including an arm connected to said second piston and projecting laterally from said barrel for axially shifting said second piston relative to said first piston and said barrel.

3,883,045
ELECTRONIC CONVEYOR FOR MOLTEN METAL WITH ELEVATED POURING TUBE

Hans Erwin Gerbig, Deutscher Staatsangehoriger, Germany, assignor to AEG-Elotherm GmbH, Remscheid, Germany

Filed Sept. 14, 1973, Ser. No. 397,328
Claims priority, application Germany, Sept. 30, 1972, 2248052
Int. Cl. B22d 37/00
U.S. Cl. 222—372 2 Claims



1. In casting equipment for pouring melts, of the type having a furnace associated with an electromagnetic conveying trough proceeding from said furnace vessel, said conveying trough having a refractory body upwardly sloping from said vessel, and an electromagnetic travelling field inductor extending along its length below said refractory body, the floor of the trough rising in the direction of a terminal wall from a point corresponding to the upper end of said conductor, the improvement comprising said terminal wall extending across the width of the trough and closing the effective open cross section of the trough, and a refractory pouring tube which passes through the trough bottom in proximity to said wall and

of which the upper end projects above the level of the adjacent floor of said trough.

3,883,046

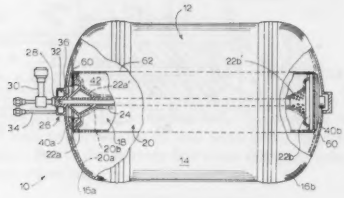
ELASTOMERIC BLADDER FOR POSITIVE EXPULSION TANK

Leo M. Thompson, Niagara Falls; Robert K. Anderson, Lockport, and Lawrence H. Kocher, Tonawanda, all of N.Y., assignors to Textron Inc., Providence, R.I.

Filed Feb. 11, 1974, Ser. No. 440,956

Int. Cl. B65d *35/28*

U.S. Cl. 222—386.5 **8 Claims**



8. A bladder for use in a positive expulsion tank having a given shell configuration, characterized as having an as-fabricated cylindrical configuration with annular attachment areas at opposite ends of an intermediate area, said bladder being formed of a resiliently deformable material and incorporating a reinforcing matrix, said matrix being patterned to prevent stretch deformation of said attachment areas and to provide for nonuniform biaxial stretch characteristics within said intermediate area whereby to permit said bladder intermediate area to be resiliently deformed radially from said cylindrical configuration to assume a tank-full configuration corresponding to said shell configuration.

3,883,047

INJECTION UNIT FOR AN INJECTION MOLDING MACHINE

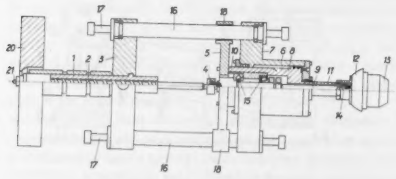
Heinz Hofer, Schoneberg, and Sushil Chaudhry, Heuchling near Lauf, both of Germany, assignors to DEMAG Kunststofftechnik Gesellschaft mit beschrankter Haftung, Nurnberg, Germany

Filed Mar. 15, 1973, Ser. No. 341,483

Claims priority, application Germany, Mar. 16, 1972, 2212752

Int. Cl. B29f *1/06*

U.S. Cl. 222—413 **3 Claims**



1. An injection unit for injection molding machines, which includes in combination: a plasticizing cylinder, a worm rotatably and axially displaceably arranged in said plasticizing cylinder, an injection cylinder arranged in substantially axial alignment with said plasticizing cylinder, fluid operable hollow piston means reciprocably arranged in said injection cylinder and having one side thereof facing said plasticizing cylinder and provided with a cylindrical extension extending through said injection cylinder in the direction toward said plasticizing cylinder, operatively connected to said worm for axially moving the same while permitting only rotation of said worm relative to said piston means, motor means comprising housing means connected to said piston means, said motor means being drivingly connected to said worm for rotating said worm, said injection cylinder being located coaxially between said motor means and said plasticizing cylinder, connecting spar means interconnecting said injection cylinder and said plasticizing cylinder so as to form a carriage therewith, guiding spar means axially displaceably supporting said carriage, and torque support means arranged on said extension outside said injection cylinder, said torque support means being axially displaceably supported by said connecting spar means, so as to prevent rotation of said hollow piston means and said motor housing means.

3,883,048

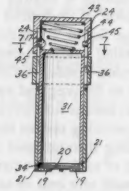
CONDIMENT DISPENSER

Morton Saipe, 6 Gault Park Dr., Westport, Conn. 06880, and George K. Maljanian, 67 Blue Ridge Rd., Wilton, Conn. 06897

Filed Nov. 29, 1973, Ser. No. 419,936

Int. Cl. B67d *3/00*

U.S. Cl. 222—518 **3 Claims**



1. A portable condiment dispenser comprising: a tubular main body element having a continuous side wall and an end wall at one end thereof defining at least one through opening, said side wall having at least one longitudinally arranged slot therein; a closure element slideably disposed within said body element, and cooperating therewith to form a condiment retaining chamber, and shiftable between first and second positions, in said first position, said closure element unobstructing said opening, and in said second position said closure element closing said opening; said closure element having manually engageable means thereon projecting through said longitudinally arranged slots; and a cap element selectively engaged upon a second end of said main body element to define therewith an enclosed cavity for the retention of a condiment.

3,883,049

PISTON-TYPE VALVE FOR MELTING FURNACES

John McCarthy, 1522 Black Hawk Trl., Benton Harbor, Mich. 49022, and Keith Paul, 1328 S. Manor Dr., St. Joseph, Mich. 49085

Filed Sept. 14, 1973, Ser. No. 397,445

Int. Cl. B22d *37/00*

U.S. Cl. 222—559 **1 Claim**

1. An apparatus for selectively controlling the transfer and retention of flowable material, comprising, in combination:

first means for containing said flowable material;

second means connected to said first means for providing a flow path between the interior and the exterior of said first means for said flowable material;

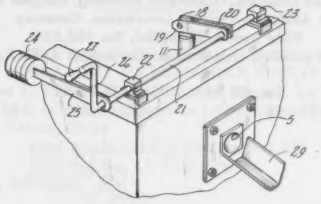
third means, at least a portion of which is contiguous with said second means for selectively opening and blocking said flow path for said flowable material; and wherein:

said first means for containing said flowable material comprises a furnace;

said flowable material comprises molten metal;

said second means comprises a heat treated steel block having the general shape of a rectangular parallelepiped,

and being provided therein with first and second passages in communication with each other which form said flow path between the interior and the exterior of said furnace; said second means being disposed within a wall of said furnace at a position which is normally below the uppermost level of the molten metal in said furnace so that when said third means have selectively opened said flow path, said molten metal may flow into said first passage and then pass into said second passage for transfer to the exterior of said furnace;



said first passage having a central longitudinal axis which is disposed substantially perpendicular to the central longitudinal axis of said second passage;

said third means includes a piston mechanism which moves in response to an operator's lever in conjunction with a counter-weight device;

said piston mechanism being disposed, dimensioned and arranged to move within said first passage, and being provided with at least two piston rings which are spaced apart by a distance which is greater than the largest diameter of the common line of intersection between said first and second passages.

3,883,050

REFRACTORY CASTING TUBE FOR CASTING HOT LIQUID METALS

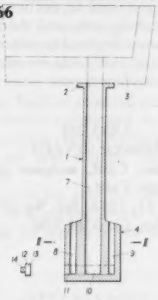
Otto Hoyer, and Erwin Kuebel, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Austria

Filed Feb. 1, 1973, Ser. No. 328,504

Claims priority, application Austria, Feb. 3, 1972, 857/72

Int. Cl. B22d *11/10*

U.S. Cl. 222—566 **2 Claims**



1. A refractory casting tube for the continuous casting of liquid steel in apparatus that includes a continuous casting mould and a tundish located above the mould, said casting tube comprising:

a tube made of refractory material and having an inner bore,

the tube being adapted to be secured at one end to the bottom of the tundish so that the inner bore of the tube communicates with the interior of the tundish,

the tube having at its other end a casting tube head that has a closed bottom and at least one canal extending vertically upwardly to define a vertically upwardly directed outlet for the casting tube head, the vertically extending canal being substantially parallel to the inner bore of the tube and having a length of at least four centimeters,

the casting tube head also having at least one laterally extending canal connecting the inner bore of the tube to the vertically extending canal, and

the casting tube being adapted for insertion into liquid steel in the mould during casting and being dimensioned so that the casting tube head and an adjacent lower portion of the tube can be disposed within the mould and spaced from all sides of the mould.

3,883,051

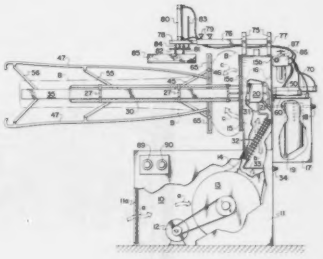
GARMENT FINISHING APPARATUS

Stanley M. Bailey, 242 Washington St., Hamburg, Pa. 19526

Continuation-in-part of Ser. No. 469,829, May 14, 1974. This application Sept. 24, 1974, Ser. No. 508,885

Int. Cl. A41h *43/00*

U.S. Cl. 223—51 **12 Claims**



1. In a garment finishing machine having a support base and a longitudinally extending supporting means carried on the support base, a steam supply header and a hot air supply duct, means for mounting a permeable garment bag along the supporting means for receiving hot air from said supply duct, a closed loop piping system extending along the supporting means and connected at an inlet end to said steam supply header for indirectly heating air within the bag, a heat exchanger within said hot air supply duct for heating air being supplied thereto, and said closed piping system having an opposite outlet end thereof connected to said heat exchanger for supplying residual heat from the steam thereto.

3,883,052

STOCKING PULLER

Julia P. Wilson, 7319 Inwood Rd., Apt. 4, Dallas, Tex. 75209

Filed Nov. 12, 1973, Ser. No. 414,641

Int. Cl. A47j *51/06*

U.S. Cl. 223—111 **4 Claims**

1. A stocking puller comprising:

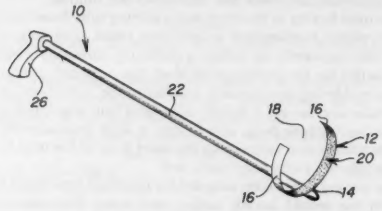
a generally U-shaped resilient stocking support member adapted for the insertion of the foot of a user therethrough;

means forming an adhesive layer on the stocking support member for retaining an open stocking thereon;

an elongate rod having the stocking support member secured to one end thereof; and

handle means secured to the opposite end of the elongate rod from the stocking support member;

said means forming an adhesive layer comprising a length of tape of the type having adhesive layers formed on both



sides thereof with one of said layers being adhesively engaged with the stocking support member.

3,883,053

INFLATABLE PAD

Frank A. Pritchard, and Bill N. Lovelace, both of 2215 Bennett, Wichita, Kans. 67213

Continuation-in-part of Ser. No. 206,623, Dec. 10, 1971, abandoned. This application Feb. 20, 1973, Ser. No. 333,990

Int. Cl. A45f *3/02*

U.S. Cl. 224—5 P **2 Claims**

1. An inflatable cushion pad for golf bag shoulder straps, or the like, comprising a flexible pocket portion, a flexible air chamber portion integrally attached along said pocket portion in juxtaposition, said air chamber portion having a plurality of end to end compartments in fluid communication with each other and bendable between said compartments, means mounted in the wall of said air chamber portion to inflate same, said pocket portion is an elongated hollow pocket open on the ends thereof, said air chamber portion extends along said pocket portion substantially covering a face of said inflatable pad, said air chamber portion is substantially the same length as said pocket portion, said means to inflate is a valve means through a wall of said air chamber portion, said valve means being openable for inflation or deflation of said air chamber portion, said air chamber portion being adapted to be positioned on one face of a strap when same is placed in said pocket portion, said pocket portion being adapted to fit around said strap in a close fitting relation when said air chamber portion is in an inflated condition, said plurality of compartments being separated by a plurality of seams transverse to said elongated pocket portion forming said compartments of substantially equal size, said inflatable pad being constructed and adapted to in use receive said strap in said pocket portion to have said plurality of compartments of said air chamber portion inflated and to be used having said air chamber portion positioned between said strap and a person and shaped to the contour of same to cushion the force of said strap when moved in contact with said person, said pad is inhibited from moving along the length of said strap by frictional engagement with said pocket and by inflation of said air chamber.

3,883,054

APPARATUS FOR INTERCEPTING AND ADVANCING THE LEADERS OF PHOTOGRAPHIC ROLL FILMS

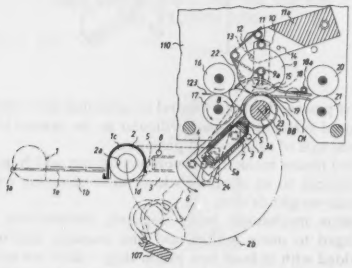
Hans Albert Butschek, Ottobrunn, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 8, 1974, Ser. No. 458,856

Claims priority, application Germany, Apr. 7, 1973, 2317590

Int. Cl. B26f *3/00;* **B65h** *75/00*

U.S. Cl. 225—93 **15 Claims**



1. Apparatus for intercepting the leader of photographic film which is convoluted on a reel within a convoluted backing strip having a front portion extending beyond the leader, comprising means for supporting a reel with convoluted film and backing strip thereon; drive means movable into engagement with the front portion of the backing strip on the reel in said supporting means to thereby loop the front portion of the backing strip; means for blocking rotation of the reel at least during engagement between the front portion of the backing strip and said drive means; means for advancing the looped front portion of the backing strip along a first path and for thereby rotating the reel in said supporting means in a direction to pay out the backing strip and the film whereby the leader of the film becomes exposed in response to rotation of the reel in said direction; and guide means for directing the leader of the film into a second path.

3,883,055

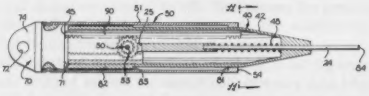
POWER STYLUS

Ralph L. Abos, Whittier, Calif., assignor to Dynapunch Systems, Inc., El Segundo, Calif.

Filed June 12, 1974, Ser. No. 478,466

Int. Cl. B26f *3/00*

U.S. Cl. 225—103 **10 Claims**



1. A stylus for punching scored areas from pre-scored sheet members comprising:

a. a housing having a first and second portion, said first postion insertable into said second portion, said first

portion having a first gear rack and said second portion having a second gear rack;

b. a compound gear means disposed in said housing being engageable with said first and second gear racks for providing a mechanical advantage; and,

c. a perforating means coupled to said gear means, said perforating means capable of being forced through one end of said housing;

whereby, a driving force may be applied to said second portion of said housing, and transmitted to said perforating means, said perforating means capable of exerting a force greater than said driving force.

3,883,056

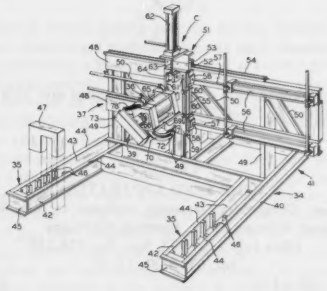
APPARATUS FOR SIMULTANEOUSLY BREAKING A PLURALITY OF FRANGIBLE SHEETS

Raymond L. Landes, Perrysburg, and Floyd F. Le Gros, Toledo, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 27, 1973, Ser. No. 391,887

Int. Cl. B26f *3/00*

U.S. Cl. 225—104 **6 Claims**



1. In an apparatus for breaking a plurality of individually scored frangible sheets stacked one against another with their score lines in superimposed relation into two units on a storage buck, the improvement comprising:

a. a base frame;

b. means affixed to said base frame for receiving and holding the buck, said means including a pair of spaced, parallel box members wherein each box member includes;

1. a plurality of spaced shoulder means, and

2. a selectively positionable plate engageable with said shoulder means so that said plate contacts and holds said storage buck in selected predetermined positions;

c. a ram device connected to said base frame and adapted to contact the outer face of the stack of frangible sheets on said storage buck and apply a force thereto; and

d. means for advancing said ram device into engagement with a stack of frangible sheets to deflect and simultaneously break the sheets of the stack along their score lines.

3,883,057

STOP-GO FILM ADVANCE MEANS

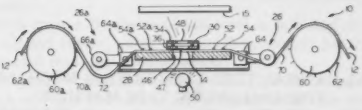
Jaroslav Kopernicky, Mississauga, Ontario, Canada, assignor to MRM Industries, Inc., Skokie, Ill.

Filed Oct. 30, 1972, Ser. No. 302,014

Int. Cl. G03b *1/28*

U.S. Cl. 226—36 **31 Claims**

1. In a film transport system for advancing picture film past a picture display area including power means for moving the film in a path between two points, and control means for advancing the film in a stop and go sequence, whereby during each sequence a different portion of film stops at the display area, said control means comprising:



means responsive to pressure of said film, for causing said different portion of film to advance after stopping at the display area.

3,883,058

DEVICE FOR THE INCREMENTAL ADVANCEMENT OF A LABEL TAPE

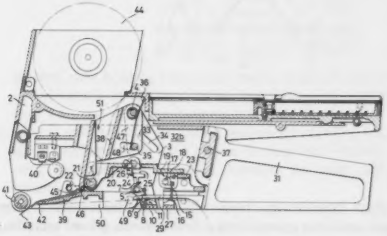
Kurt Schrotz, and Werner Becker, both of Hirschhorn, Germany, assignors to Dymo Industries, Inc., San Francisco, Calif.

Filed Apr. 17, 1974, Ser. No. 461,640

Claims priority, application Germany, Apr. 21, 1973, 2320333

Int. Cl. B65h *17/40*

U.S. Cl. 226—53 **9 Claims**



1. A device for the incremental advancement of a label carrier tape along a prescribed path of travel, the tape being provided with openings for gauging the advanced increments, said device comprising:

a frame;

a carrier rocker arm pivotally mounted on the frame for oscillatory movement in the general direction of travel of the tape between a retracted position and an advanced position;

a latch on the carrier rocker arm for engaging the tape and advancing increments thereof, the latch including latch teeth for biting into the label carrier tape in response to movement of the latch into a latching position and advancement of the latch in the direction of travel of the tape, a gauge feeler, and means resiliently biasing the gauge feeler such that the gauge feeler will intercept and enter an opening in the label carrier tape and, upon entering into the opening, will enable movement of the latch into the latching position;

a jaw member juxtaposed with the latch teeth, the jaw member having a guide surface for guiding the tape between the latch and the jaw member, the guide surface including grooves corresponding with the latch teeth and the feeler of the latch; and

a lock pawl located along the path of travel of the tape beyond the advanced position of the carrier rocker arm, the lock pawl being mounted on the frame for pivotal movement about an axis between a locking position and a released position, said lock pawl including teeth for engaging the tape in the locking position of the lock pawl and precluding retraction of the tape;

means resiliently biasing the lock pawl toward the locking position; and

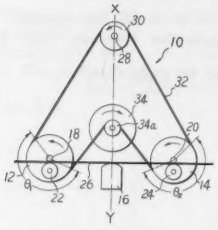
means enabling movement of the lock pawl toward the release position in response to advancement of the tape.

3,883,059

DUAL CAPSTAN TYPE TAPE DRIVING MECHANISM FOR A MAGNETIC TAPE MACHINE

Niro Nakamichi, Tokyo, Japan, assignor to Nakamichi Research, Inc., Tokyo, Japan

Filed July 11, 1974, Ser. No. 487,553
Claims priority, application Japan, July 12, 1973, 48-78711
Int. Cl. B65h *17/20*
U.S. Cl. 226—108 **6 Claims**



1. A dual capstan type tape driving mechanism for a magnetic tape machine comprising a first capstan wheel including a first capstan coaxially secured thereto, a second capstan wheel including a second capstan coaxially secured thereto, and a drivingly rotating member associated with both of said first and second capstan wheels so that they are driven in the same direction for movement of a tape engaging said first and second capstans, said tape driving mechanism further comprising an inertia applying member having an inertia energy of rotation equaling to the sum of those of said first and second capstan wheels and said drivingly rotating member; said first and second capstan wheels, said drivingly rotating member and said inertia applying member each being in the form of pulley with a single belt of less expansibility engaging them so that said inertia applying member rotates in the opposite direction to those of said first and second capstan wheels and said drivingly rotating member.

3,883,060

LOOP FORMING APPARATUS

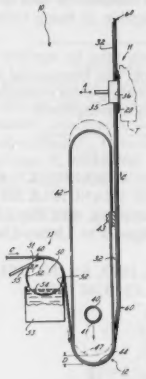
Eric W. Scarpa, Cincinnati, Ohio, assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Jan. 4, 1973, Ser. No. 320,859
Int. Cl. B65h *17/42*
U.S. Cl. 226—113 **11 Claims**

1. Apparatus for forming a loop in a web within a web handling apparatus, said loop forming apparatus comprising: a flexible sheet having a curvilinear portion disposed adjacent a path of said web, said sheet forming a closed loop having a web engaging outer side,

means for fixing a portion of said flexible sheet to a stationary element of said web handling apparatus so that the closed loop formed by said sheet is movable about the fixed portion thereof, and

means for blowing air directly onto an internal side of said sheet within said closed loop and for thereby urging said



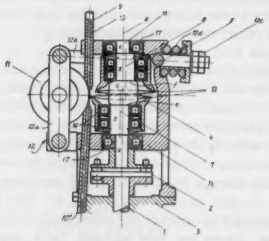
curvilinear portion of said sheet against said web to form a loop in said web.

3,883,061

WIRE-FEED APPARATUS

Kurt Thor, Bergheide, Germany, assignor to Veb Mansfled Kombinat Wilhelm Pieck, Eisleben, Germany

Filed July 11, 1973, Ser. No. 378,259
Int. Cl. B65h *17/22*
U.S. Cl. 226—154 **6 Claims**



1. An apparatus for longitudinally advancing an elongate workpiece, comprising:

supporting means for said workpiece;

a unitary shaft adjacent said supporting means;

drive means coupled with said shaft for rotating same; and

a pair of feed rollers mounted on said shaft with opposite angles of inclination relative to the axis of rotation thereof, said feed rollers being centered on roller axes skew to each other and to said axis of rotation on opposite sides of the latter, said feed rollers being provided with sharp peripheral edges executing wobbling motions 180° out of phase upon rotation of said shaft, said feed rollers being disposed close enough to said supporting means to come into intermittent contact with said workpiece for alternately entraining same in a predetermined direction.

3,883,062

CARTRIDGE EJECTION DEVICE FOR AN EXPLOSION DRIVEN SETTING GUN

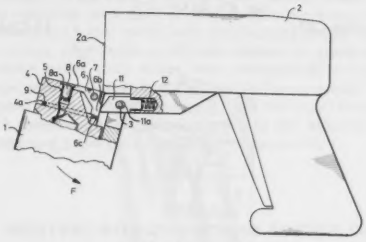
Peter Jochum, Meiningen, Austria, assignor to Hilti Aktiengesellschaft

Filed May 30, 1973, Ser. No. 365,059

Claims priority, application Germany, June 7, 1972, 2227775

Int. Cl. B25c *1/08*

U.S. Cl. 227—9 5 Claims



1. Explosion driven setting gun for driving fastening elements into a hard target material, such as steel, concrete and the like, comprising a first gun part and a second gun part pivotally interconnected to one another so that the gun can be displaced between an open condition and a closed condition by pivotally displacing said gun parts relative to one another, a cartridge chamber formed in said first gun part, a two-arm ejection lever pivotally mounted on said first gun part for displacing a spent cartridge lodged in said cartridge chamber and having a first arm and a second arm extending angularly from said first arm, a spring biased stop assembly mounted on said second gun part, said first arm of said lever arranged to extend under the bottom edge of a cartridge within said cartridge chamber and said second arm arranged to cooperate with said stop assembly in the opened position of the gun so that said stop assembly pivots said lever so that said first arm dislodges a spent cartridge from the cartridge chamber, wherein the improvement comprises that said second arm has a detent formed therein, and an annular resilient locking member encircling and mounted on the outer surface of said first gun part and extending outwardly therefrom into the pivotal range of said detent and being displaceably lockably engageable within said detent for gripping said ejection lever against pivotable displacement so that said first arm is held in position ready to dislodge a spent cartridge as the gun is moved to the open condition, and said locking member being displaceable from said detent under the application of a predetermined load on said second arm from said stop assembly as said gun is displaced into the open condition.

3,883,063

PUNCHING AND STAPLING APPARATUS

Arnold Fassman, Westport, and Robert E. Mersereau, Stamford, both of Calif.

Filed Feb. 1, 1974, Ser. No. 438,689

Int. Cl. B27f *7/08*

U.S. Cl. 227—21 19 Claims

1. Apparatus for punching holes in stacks of paper and for stapling the stacks together in the region of the sheets where the holes are punched, comprising:

means providing for movement of the stacks of paper into operating position;

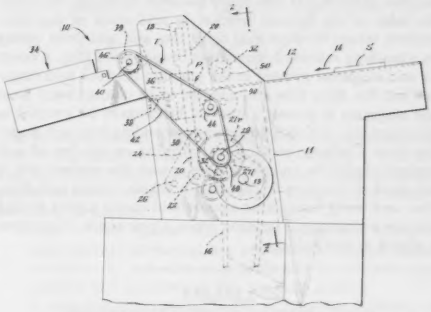
first and second operating stations located a preset distance apart along the line of movement of the stacks of paper;

means for arresting the movement of each stack as it reaches said first operating station with the sheets thereof in assembled registry to accommodate a punching operation through all of the sheets of the stack;

means at said first operating station for punching holes through all of the sheets of the assembled stack, said punching means being operative to form said holes in said region of said paper a short distance from one edge of the sheets;

means to engage the sheets of said stack to hold said sheets in aligned registry after the punching means has been retracted from the stack of sheets;

means operative with said holding means for advancing said stack of paper forward a predetermined distance along said line of movement, said predetermined distance being at least substantially equal to said preset distance so that said region of said papers stops at said second operating



station, said holding means serving to maintain said sheets of said stack in registry during the advancing movement into said second operating station; and

means at said second operating station for stapling together all of said sheets in said region thereof and closely adjacent said holes previously formed by said punching means;

said holding and advancing means comprising drive roll means arranged to move into pressure-gripping engagement with the stacked sheets and to rotate through a predetermined angle to advance the stacked sheets so held said predetermined distance to position said sheet region where the holes are punched at the second operating station.

3,883,064

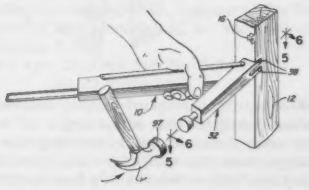
BRACKET SETTING TOOL

Thomas M. Hilgers, Rt. No. 83, Box 232A, Mundelein, Ill. 60060

Filed Mar. 29, 1974, Ser. No. 456,367

Int. Cl. B25c *1/02*

U.S. Cl. 227—120 12 Claims



1. A bracket setting tool having a drive tube for encasing a drive mechanism and a magazine for receiving a stack of brackets, said magazine intersecting said drive tube at an acute angle, said drive mechanism comprising a drive bolt having a contacting head exposed externally of said tubing, a drive slug slidably mounted in said tubing and being connected to said drive bolt, a guide tube plate mounted in said tubing and having a bolt guide tube telescopically receiving

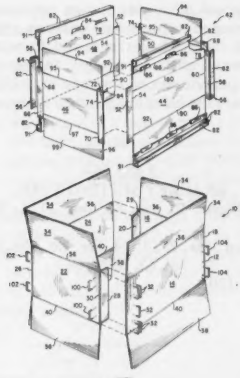
said drive bolt, compression spring means encircling said drive bolt and urging said drive slug and said guide tube plate apart, plural drive legs keyed to said drive slug for movement with said drive slug, one of said drive legs being a bottom leg positioned on the bottom of said drive tube and having a bifurcated pair of fingers extending forward in position to engage a bottom bracket in the stack of brackets in said magazine, the forward edge of said fingers being partially sloped in a plane common to the acute angle of the plane of the wall of the magazine so as to permit the stack of brackets to advance the bottom bracket into position for setting, two of said drive legs being side drive legs, each said side drive leg having an inwardly directed drive finger, a camming member in said drive tube in the path of movement of each side drive finger which member deflects said side finger inwardly to engage the opposite sides of the bottom bracket in said stack of brackets, resilient means between said drive slug and said drive tubing for absorbing rearward movement of said drive slug, a cover for said magazine pivoted at the junction between said magazine and the drive tube and adapted to be pivoted away from said magazine to permit a stack of brackets to be inserted in said magazine, a U-shaped retainer extending into said magazine from a remote end thereof, a spring on one leg of said retainer urging the end of said leg against the remote end of said stack of brackets to urge said brackets toward said drive tube, and being retractable against said spring urging to said retainer a disengaged position when a new stack of brackets is placed in said magazine.

3,883,065

COLLAPSIBLE SHIPPING CONTAINER

Michael C. Presnick, c/o Metatronics Manufacturing Corp., 111 Bloomingdale Rd., Hicksville, N.Y. 11801

Filed June 28, 1973, Ser. No. 374,368
Int. Cl. B65d *5/40, 5/62, 25/14*
U.S. Cl. 229—14 R **6 Claims**



1. A collapsible corrugated shipping container with a self-contained corrugated liner comprising

a. an outer container portion including four consecutively hinged outer side walls of predetermined height;

b. top and bottom outer closing flaps hinged to said outer side walls;

c. a liner portion including four separate inner side walls, each having a spacing extension means projecting laterally from one end thereof;

d. L-shaped connecting means articulated at the other ends of said liner walls;

e. fastening means joining inner legs of said connecting means to the extension means of adjacent liner walls and joining outer legs of said connecting means to each of said outer walls thereby mutually spacing said inner and outer walls; and

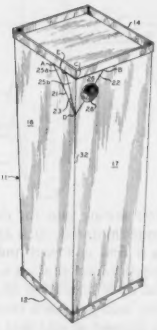
f. top and bottom liner closing flaps articulated to said inner walls.

3,883,066

RECLOSABLE CONTAINER

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 30, 1973, Ser. No. 393,166
Int. Cl. B65d *5/72*
U.S. Cl. 229—17 **12 Claims**



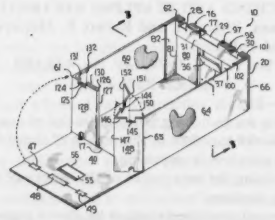
1. A container having a generally tubular body member; a bottom closure means affixed to one end of said body member; a top closure means affixed to the other end of said body member; pouring closure means hinged to said body member and closing said container in a stable closed first position, said pouring closure means being capable of being forced inwardly to arrive at a stable open second position; and reclosure means comprising a rigid structure firmly attached to said pouring closure means but unattached to any other part of said container, overlapping said body member across a line at which said pouring closure means and said body member are hinged, and contacting said hinge line between said closure means and said body member.

3,883,067

CARTON CORNER CONSTRUCTION

Thomas P. McGlynn, Short Hills, N.J., and Carl H. Yentsch, Philadelphia, Pa., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,587
Int. Cl. B65d *5/24, 5/22*
U.S. Cl. 229—31 FS **4 Claims**



1. A carton blank comprising a bottom panel defined by spaced first and second parallel fold lines and spaced third and fourth parallel fold lines collectively defining a polygonal area, an end panel connected to said bottom panel at each of said

third and fourth fold lines, a side panel connected to said bottom panel at each of said first and second fold lines, a corner reinforcing panel between each adjacent side and end panel, each said corner reinforcing panel having fold line means for folding said corner reinforcing panel portions in parallel contiguous relationship and a third reinforcing panel portion transverse thereto, said fold line means are a pair of spaced parallel fold lines, said pair of panel portions are of substantially equal areas, a locking panel having openings therein joined by a fifth fold line to each end panel, means for directly interlockingly securing each locking panel through said openings to a pair of said reinforcing panel portions adjacent each end panel, said interlocking means including projecting edge portions of both reinforcing panel portions foldable upon each other into substantially co-extensive shape, size and area, and a sixth fold line generally linearly aligned with said fifth fold line at each end panel for securing each third reinforcing panel portion to the adjacent pair of reinforcing panel portions associated therewith.

3,883,068

MOISTURE BARRIER PACKAGE FORMED FROM LAMINATED BLANK

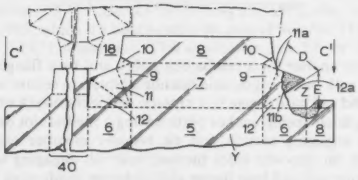
Stanley Milton Silver, London, England, assignor to Paxall, Inc., Chicago, Ill.

Filed Apr. 3, 1973, Ser. No. 347,464

Claims priority, application United Kingdom, Apr. 10, 1972, 16351/72; Aug. 1, 1972, 35779/72; Nov. 4, 1972, 50956/72

Int. Cl. B65d *5/56, 5/62*

U.S. Cl. 229—31 R **4 Claims**



3. A top-loading package in the form of a tray and a hinged cover having a moisture-barrier interior lining, which package is formed from a single blank comprising a lamination of a unitary fibreboard substrate and a heat-sealable moisture-resistant sheeting laminated together by a heat-weakenable laminating material, the shape of said substrate being dissimilar to the shape of said sheeting so that selected peripheral web portions of said sheeting are unsupported by said substrate, said tray having four side walls connected to one another by generally triangular corner panels hinged respectively to the edge of one side wall, said blank being formed with a further triangular panel hinged to each said first-mentioned triangular panel and with an unsupported sheeting web portion of generally triangular shape joining each said further triangular panel to its adjacent sidewall, said blank being folded so that said unsupported web panel is disposed between said further triangular panel and the outer surface of the adjacent sidewall and being heat-sealed to both to provide a sealed corner, three of said sidewalls having sealing flaps hinged to the upper edges thereof and said cover including three cooperating sealing panels hinged thereto, said sealing flaps and panels being heat-sealed to one another to completely close said package interior lining, and the substrate of said cover and its hinged sealing panels being delaminated from the sheeting portion thereof.

3,883,069

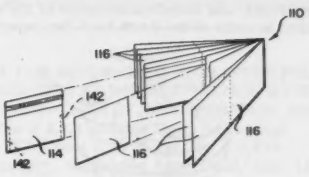
BOOKLET WITH ATTACHED ENVELOPES

John K. Volkert, Northfield, Ill., assignor to Compak Systems, Inc., Northfield, Ill.

Division of Ser. No. 174,321, Aug. 24, 1971, Pat. No. 3,718,277. This application Nov. 16, 1972, Ser. No. 307,104

Int. Cl. B65d *27/06*

U.S. Cl. 229—73 **5 Claims**



1. A single, folded, printed blank for forming a booklet for distributing printed material and return envelopes to a recipient, said folded blank comprising a plurality of superimposed panels interconnected to one another along spaced parallel horizontal fold lines

A. one of said panels being folded upon itself along an intermediate horizontal line and secured in such folded condition by adhesive to provide side-by-side envelope pockets and an envelope flap for each pocket,

1. said one panel having a strip of envelope adhesive on each of said envelope flaps, and

2. said one panel having a line of weakness intermediate of adjacent envelopes to facilitate separation thereof from each other,

B. at least one other of said panels being provided with a line of weakness to facilitate the separation of a portion thereof which is insertable into one of said envelope pockets,

C. said panels being arranged in superimposed relation to one another,

D. said panels being interconnected to one another along a common vertical line perpendicular to said intermediate line and also being foldable about said common vertical line to create a booklet; and

E. said horizontal intermediate line being located slightly vertically above the lowermost of said parallel fold lines, so that it is unaffected when the upper and lower edges of said folded printed blank are removed to cause said panels to become separate sheets.

3,883,070

METHOD AND APPARATUS FOR AIDING IN SOLUTION OF THREE-DIMENSIONAL FIRE CONTROL PROBLEMS

Lloyd Z. Maudlin, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1964, Ser. No. 363,676

Int. Cl. G06g *1/00*

U.S. Cl. 235—61.5 B **6 Claims**

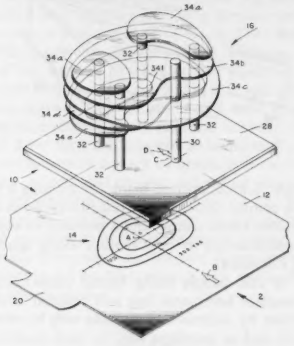
1. Apparatus for aiding in the solution of a fire control problem for a weapon adapted to attack an underwater target, said weapon being of a type traveling along an air-trajectory to a point on the surface of the water in the vicinity of the target and thence along an underwater trajectory in response to a self contained control, said control causing the weapon to have predetermined characteristics affecting the likelihood of hitting a target under various spacial and relative motion situations, said apparatus comprising;

a. an air-trajectory dispersion error curve representing probable area within which the weapon will enter the water for a given aimpoint,

b. a rigid element including

c. a reference marker representing a position datum of the target, said position datum consisting of the azimuthal coordinates only of the target position; and

d. a stack of parallel spaced transparent members, the individual members of said stack each representing the area on the surface of the water within which the weapon should enter the water in order to have a desired likelihood of hitting a target at said datum position for a different depth level of a predetermined series of separated depth levels, said individual members of the stack being stacked in order of the depth level they represent, and



e. the construction and arrangement being such that said stacked members provide a three-dimensional image of desired water entry areas for different depths in superposed relationship to the air-trajectory dispersion error curve, said dispersion error curve and said rigid element being movable relatively whereby the effect of various adjustments of aim-point relative to the target position datum upon the fire control problem solution for various depth levels of the target may be readily envisioned.

3,883,071

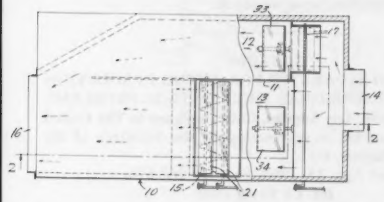
MIXING BOX AND CONTROL THEREFOR

Gershon Meckler, 2750 Ridge Valley Rd., Atlanta, Ga. 30327

Filed Dec. 18, 1972, Ser. No. 316,379

Int. Cl. F24f *13/04*; **G05d** *23/13*

U.S. Cl. 236—49 **9 Claims**



1. A mixing box defining a substantially closed passage for the flow of air from an inlet end to an outlet end thereof, nozzle means intermediate the inlet and outlet ends of the mixing box, there being three openings through which air can flow from the exterior of the mixing box into the closed passage, the openings being so positioned that air flowing through said nozzle means induces a flow of air from the exterior of the mixing box through the openings and into the closed passage, a damper for each of the openings, each of said dampers being movable between an open position in which it is ineffective, and a closed position in which it is effective, to prevent flow of air through the openings, means defining a by-pass passage through which air can flow from the inlet end to the outlet end of the mixing box without passing through said nozzle means, a by-pass damper movable between an open position in which it is ineffective, and a closed position in which it is effective, to prevent flow of air through the by-pass passage, at least one actuator for said dampers and for said by-pass damper, said by-pass damper and the actuator therefor being effective, in response to a control signal indicating an air conditioning load between a minimum and an intermediate magnitude, to close said by-pass damper and, in response to a control signal indicating an air conditioning load between the intermediate and a maximum magnitude, to move said by-pass damper toward an open position, said dampers and the actuator for each being effective, in response to a control signal indicating an air conditioning load above the intermediate magnitude to open a first one and to close the others of said dampers, and, in response to a signal indicating an air conditioning load between the minimum and the intermediate magnitude to move the first two of said dampers toward an open position and the third of said dampers toward a closed position.

3,883,072

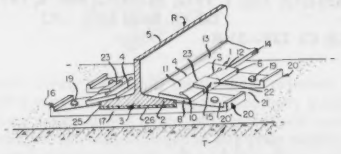
RAIL ANCHOR

John S. Newton, Glen Ellyn, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed Apr. 5, 1974, Ser. No. 458,123

Int. Cl. E01b *9/00*

U.S. Cl. 238—338 **10 Claims**



1. An anchor for a rail having a web and base flanges provided with outer edges, said anchor adapted to secure at least one said rail base flange to a crosstie and including, a substantially planar spring anchor plate having a medial slot defining a rail engaging section and tie retainer member engaging section on opposite sides thereof, said rail engaging section overlying said rail base flange and having an inside edge terminating short of said rail web, said tie member engaging section provided with an outside edge, retainer means fixedly attached to said crosstie and provided with a generally horizontal slot having its innermost edge terminating outside the vertical plane of said flange outer edge, and said spring anchor plate tie member engaging section engaged by said retainer means slot to bias the undersurface of said rail engaging section against the upper surface of said rail base flange to inhibit creeping of said rail over said crosstie.

3,883,073

OSCILLATING SPRAYING APPARATUS

Vincent Pierre Marie Ballu, Epernay, France, assignor to Tecnoma, Epernay, France

Filed July 5, 1973, Ser. No. 376,391

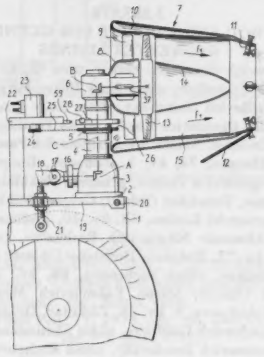
Claims priority, application France, July 7, 1972, 72.24659

Int. Cl. B05b *3/00*, *17/00*

U.S. Cl. 239—77 **23 Claims**

1. Oscillating spraying apparatus comprising a frame, a substantially L-shaped supporting casing having a substantially vertically extending portion rotatably mounted on said frame, a bevel gear member located within said supporting casing and having an input shaft concentrically located within said portion and an output shaft at right angles thereto, means for connecting said shaft to drive means for rotation thereof in a given direction, a spraying unit mounted on the supporting casing and including a fan element connected to said output shaft, an oscillating hydraulic motor carried by said

frame, means connecting said hydraulic motor to said rotatably mounted supporting casing for oscillation thereof in two directions of which one is the given rotating direction of said input shaft, means to detect the latter direction, and means for



controlling said hydraulic motor, said control means including a braking member connected to said detecting means and operated thereby, whereby said spraying unit including said fan and said supporting casing are oscillated at the same speed in both directions.

3,883,074

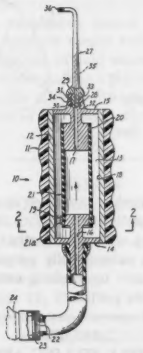
HYDRAULIC OSCILLATOR AND SYSTEMS UTILIZING THE SAME

John W. Lambert, 18815 Milton, Glendora, Calif. 91740

Division of Ser. No. 227,379, Feb. 18, 1972, Pat. No. 3,810,465, which is a continuation-in-part of Ser. No. 110,094, Jan. 27, 1971, abandoned. This application Jan. 23, 1974, Ser. No. 435,635

Int. Cl. B05b *1/08*

U.S. Cl. 239—101 **11 Claims**



1. A hydraulic oscillator for providing a cyclically varying outlet flow from a steady inlet flow, comprising: a rigid pressure chamber; a charge of gas contained in said chamber; a conduit passing through and beyond said chamber, said conduit comprising an inlet passage, an outlet passage, said passages having the properties of impedance and resistance to liquid flow, and a flexible, collapsible-walled tubular portion extending between and interconnecting said passages, that part of the tubular portion which extends between the passages having an outside wall which is fully peripherally exposed to the gas in the chamber, the inlet passage being adapted for connection to a source of liquid under supply pressure, the impedance of the inlet passage being sufficiently large so as substantially to isolate the tubular portion dynamically from the pressure source, the pressure of the chamber being above that critical level at and above which oscillation will always occur, and less than the pressure of the source, and the resistance and dynamic impedance of the outlet passage being such as to secure a cyclical output of the desired frequency, phasing between pressure levels within a single cycle, and shape and volume of the drops in the output stream.

3,883,075

DEVICE FOR GENERATING HIGH-SPEED PULSED LIQUID JETS AT HIGH REPETITION RATES

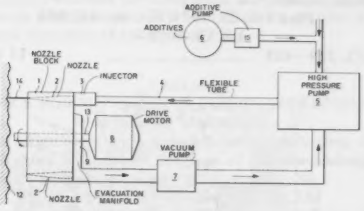
Barry E. Edney, Canton of Vaud, Switzerland, assignor to Institut Cerac SA, Canton of Vaud, Switzerland

Filed June 6, 1974, Ser. No. 476,859

Claims priority, application Switzerland, June 12, 1973, 8462/73

Int. Cl. B05b *1/08*

U.S. Cl. 239—101 **18 Claims**



1. A device for generating high-speed pulsed liquid jets at a high repetition rates in cumulation jet nozzles to, for example, cut, break, deform, clean materials, comprising:

a high pressure liquid pump (5);

at least one injector means (3) coupled to and receiving pressurized liquid from said high pressure pump (5); and a rotatable nozzle block (1) in liquid connection with said high pressure pump (5) through said at least one injector means (3), said nozzle block (1) having a plurality of nozzles (2) situated generally at the periphery thereof and arranged about the axis of rotation thereof, said nozzles (2) passing through the whole width of said nozzle block (1), the axes of said nozzles (2) being inclined to the axis of rotation of said nozzle block (1) at an angle (α) which is a function of the speed of rotation of said nozzle block (1) and the injection speed of the liquid injected into the nozzles (2) by said at least one injector means (3).

3,883,076

ROTARY NOZZLE FOR SPRAYING LOW-CALORIC FLUID VISCOUS SUBSTANCES IN PROCESS OF BURNING

Georgy Alfonsovich Vorms, prospekt Oktyabrya 133, kv. 35.; Petr Ivanovich Kuznetsov, ulitsa Rossiiskaya 56"v", kv. 51., and Vladislav Borisovich Volkov, ulitsa Koltsevaya 169, kv. 6., all of Ufa, U.S.S.R.

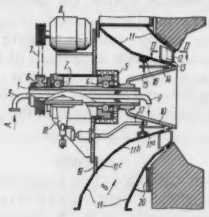
Filed Oct. 31, 1973, Ser. No. 411,409

Int. Cl. B05b *3/02*

U.S. Cl. 239—214.23 **5 Claims**

1. A rotary nozzle for spraying fluid low-caloric viscous substances in the course of their burning, comprising: a housing; a hollow shaft rotatably installed in said housing; a rotary sprayer located on the end of the said hollow shaft; a pipe for supplying fluid substances to the internal surface of said rotary sprayer; a circular air duct narrowing in a taper and located around said rotary sprayer; rotatable blades located in the minimal outlet cross-section of said circular air duct and

providing the variation of the cross-section of said air duct for controlling the amount of air supplied to maintain burning and



swirling of the air flow in the direction reverse to that of the rotation of said rotary sprayer.

3,883,077

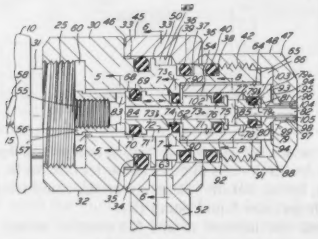
SPRAYER

Omar V. Showalter, Pipersville, Pa., assignor to William L. Brehm, Atlanta, Ga.

Filed Feb. 13, 1974, Ser. No. 441,958

Int. Cl. B05b 7/12

U.S. Cl. 239—415 **11 Claims**



1. A sprayer for liquids comprising

a sprayer control body of generally tubular form and having an inlet end with a first interior bore terminating at an interior shoulder and a delivery end with a second interior bore extending from said shoulder,

a connection to a source of liquid under pressure to be dispensed and connected to the inlet end of said body,

a spool fixedly mounted in said body and extending from said shoulder toward said outlet,

a nozzle nut carried on said delivery end of said body,

a valve plunger movable in said body,

a spring urging said plunger in one direction,

a member for moving said plunger against the force of said spring,

said spool and said valve plunger having portions providing a restricted discharge passageway for atomization of liquid delivered therefrom,

said body and said plunger defining first liquid passageways, said plunger and said spool defining second liquid passageways communicating with said first passageways for delivery of liquid to and through said discharge passageway,

a first flow control member interposed between said spool and said plunger member and upstream of said discharge passageway cutting off liquid flow through said passageways in one position of said plunger,

an additional pressure fluid supply connection on said body for gas under pressure,

said body and said spool having portions defining fluid passageways for delivery of said gas from said additional supply connection,

said nozzle nut and said spool having portions providing a restricted discharge passageway to which said last mentioned fluid passageways are connected for discharge to gas contiguous to said liquid discharge passageway, and a second flow control member interposed between said body and said plunger for cutting off gas delivery in said one position of said plunger.

3,883,078

METHOD AND A DEVICE FOR GUNNITING CONVERTER LININGS

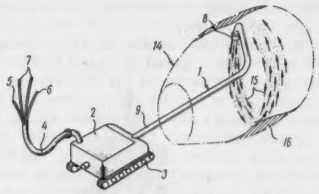
Oleg Nikolaevich Chemeris, bulvar mira 18, kv. 69; Evgeny Vasilievich Tretyakov, ulitsa Rozy ljuxemburg, 30, kv. 32; Viktor Kirillovich Didkovsky, ulitsa Rozy ljuxemburg 30a, kv. 42; Vilen Davidovich Kanfer, ulitsa Tsusimskaua, 63, kv. 17, all of Donetsk; Nikolai Konstantinovich Paschenko, ulitsa Makara Mazaua, 74, kv. 1, Zhdanov, Donetskoi oblasti; Izmail Grigorievich Zeltser, prospekt Nakhimova, 154, kv. 29, Zhdanov, Donetskoi Oblasti; Grigory Mikhailovich Ljukimson, prospekt Lenina, 45, kv. 10, Zhdanov, Donetskoi Oblasti; Alexandr Nikolaevich Bashkatov, pereulok Sadkovy, 70, kv. 72, Zhdanov, Donetskoi Oblasti; Boris Nikolaevich Melnikov, ulitsa Sechenova, 68, kv. 27, Zhdanov, Donetskoi Oblasti; Miron Yakovlevich Medzhibozhsky, perelok Nakhimova, 5, kv. 26, Zhdanov, Donetskoi Oblasti; Ilya Alexandrovich Goldberg, ulitsa Shaumiana, 47, kv. 35; Izrail Abramovich Juzefovsky, ulitsa Reshetova, 5, kv. 55, both of Leningrad; Rafail Davidovich Ratmansky, ulitsa Ilicha, 52, kv. 53; Viktor Nikolaevich Irkha, both of Zhdanov, Donetskoi Oblasti; Jury Nikolaevich Borisov, Hovokuznetsk Kemerovskoi Oblasti, and Fedor Filippovich Kurochkin, Zhdanov, Donetskoi Oblasti, all of U.S.S.R.

Continuation of Ser. No. 221,655, Jan. 28, 1972, abandoned. This application Aug. 31, 1973, Ser. No. 393,406

Int. Cl. F23d 11/16

U.S. Cl. 239—422 **1 Claim**

1. A device for deposition of refractory material on linings of a symmetric converter by the cyclone method comprising a concentrically arranged ducting for conveying pulverized refractory material and fuel to a nozzle mounted at one end of said ducting, which ducting has a substantially straight main portion for extending along the longitudinal axix of the converter and a further portion extending from the main portion at an angle of substantially 15° to 90° to the main portion, the nozzle communicating with said further portion and being disposed with its axis substantially perpendicular to that of said further portion and to a plane common to said main portion and said further portion.



3,883,079

PASTRY SHELL FILLING APPARATUS

Imre F. Papai, 2818 E. 119 St., Cleveland, Ohio 44120

Division of Ser. No. 250,933, May 8, 1972, Pat. No. 3,780,643. This application Oct. 1, 1973, Ser. No. 402,475

Int. Cl. A47j 44/00; B02c 18/02

U.S. Cl. 241—94 **4 Claims**

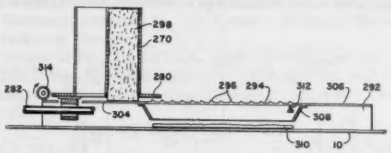
1. Grated foodstuff dispensing means comprising in combination:

a. means for holding a gratable foodstuff;

b. a grate having a leading edge and a trailing edge and relatively translatable with respect to said holding means;

c. means for relatively translating said grate and said

holding means to and fro along a substantially horizontal interface; and



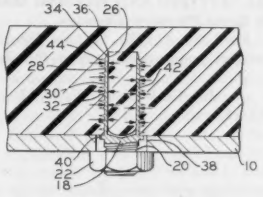
d. means for upwardly inclining the trailing edge of said grate.

3,883,080

RETAINING ARRANGEMENT FOR RUBBER LINER

Sven E. Andersson, Chagrin Falls, Ohio, assignor to Trelleborg Rubber Company, Inc., Solon, Ohio

Filed Feb. 11, 1974, Ser. No. 440,995
Int. Cl. B02c *17/22*
U.S. Cl. 241—182 **11 Claims**



1. A lining and fastener arrangement for a device having a surface subject to wear comprising, lining means of wear resistant resilient material covering said surface, and self-tapping fastener means attaching said lining means to said device, said fastener means including hollow externally threaded shank means rotatably embedded in the material of said lining means, said shank means having an end in said lining means, said fastener means including means denoting the depth of embedment of said shank means in said lining means, said lining means having a thickness in the direction of the axis of said fastener means, and said denoting means being spaced from said end of said shank means a distance less than said thickness.

3,883,081

APPARATUS FOR SHREDDING BALEFORMED COMPRESSED FIBER MATERIAL

Birger Dahl, Sarpsborg, and Arne Ludvig Hannestad, Fredrikstad, both of Norway, assignors to Aktieselskapet Borregaard, 1700 Sarpsborg, Norway

Filed Feb. 12, 1974, Ser. No. 441,829
Claims priority, application Norway, Feb. 14, 1973, 599/73
Int. Cl. B02c *23/02*
U.S. Cl. 241—281 **9 Claims**

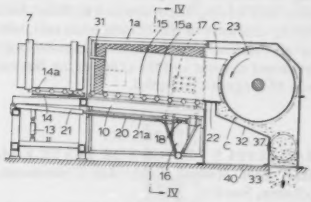
1. An apparatus for shredding bales composed of a plurality of relatively loosely adhering slabs of compactly pressed fiber material, such as flash dried wood pulp, the fibers of said fiber material having a split direction substantially parallel to the interfaces between said slabs, said apparatus comprising:

a rotating cylinder having shredding teeth on the periphery thereof;

conveyor means for passing said bales along a bale path to a position adjacent said shredding teeth, said bales being located with said split direction transverse to the plane of said conveyor means;

guide means positioned on opposite lateral sides of said conveyor means for guiding said bales along a portion of said bale path adjacent said shredding teeth; and

clamping means mounted with respect to said conveyor means for clamping opposite lateral sides of a bale in a



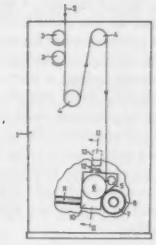
clamping direction transverse to said bale path and parallel to the longitudinal axis of said cylinder and for forcibly feeding said thus clamped bale along said bale path into contact with said shredding teeth, whereby said shredding teeth penetrate said bale in a direction parallel to said split direction and shred said bale.

3,883,082

DEVICE FOR SUPPRESSING BOBBIN VIBRATIONS IN WINDING MACHINES

Martin Gritschke, Okarben, and Bernd Kretschmann, Offenbach, both of Germany, assignors to Zimmer Aktiengesellschaft, Frankfurt, Germany

Filed Nov. 15, 1973, Ser. No. 416,234
Claims priority, application Germany, Nov. 16, 1972, 2256270
Int. Cl. B65h *54/52*
U.S. Cl. 242—18 B **4 Claims**



1. An improved device for suppressing imbalance vibrations in the bobbin or drive roller of a friction-drive thread winding machine comprising:

first support means mounted on the thread winding machine for supporting the bobbin;

second support means mounted on the thread winding machine for supporting the drive roller, one of the first and second support means being relatively movable with respect to the other support means so as to permit the cylindrical surfaces of the bobbin and the drive rollers to move relatively into and out of contact with each other to rotate the bobbin as thread is being wound thereon;

friction means mounted on the movable one of the first and second support means for movement therewith, along a predetermined path of movement, the friction means having a first flat surface lying in a plane substantially perpendicular to the axes of the bobbin and the drive roller; and

stationary plate means mounted rigidly on the thread winding machine adjacent to the path of movement of the

friction means and having a second flat surface substantially parallel and opposed to the first flat surface of the friction means so that the flat surfaces may slide over each other as the bobbin and drive roller move away from and toward each other, the first and second flat surfaces being in surface-to-surface contact when the bobbin is empty and having their contact surface decrease as the winding diameter of the bobbin increases; with one of the first and second flat surfaces being the pole faces of a permanent magnet and the other of the flat surfaces being made of magnetic material.

3,883,083

THREAD SUPPLY DEVICE FOR TEXTILE MACHINES

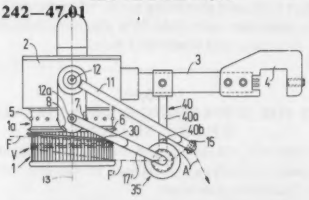
Karl Isac Joel Rosen, S-52 300-Ulricehamn, S-52300-Ulricehamn, Sweden

Continuation-in-part of Ser. No. 312,048, Dec. 4, 1972, Pat. No. 3,820,731. This application June 8, 1973, Ser. No. 368,172

Claims priority, application Germany, June 13, 1972, 2228754

Int. Cl. B65h *51/20*

U.S. Cl. 242—47.01 **10 Claims**



1. In a thread supply device for a textile machine having a drum which can be set in rotation and upon which a thread issuing from a storage coil can be tangentially wound up to form an intermediate thread storage, a thread guide element for engaging the thread as unwound from said drum, means supporting the thread guide element for movememt in a direction transversely to the thread unwinding from the drum, and a thread support element having a part which is in contact with the thread unwinding from the drum and is movable between first and second positions, said part being in radially spaced relation to the drum circumference in said first position for positive thread supply and in alignment with the drum axis in said second position for intermittent thread supply, comprising the improvement wherein the part of the thread support element which is in contact with the thread is designed as a thread brake.

3,883,084

FILM WRAPPING APPARATUS

Toshiaki Yamaguchi; Keizo Narita, and Kimihiro Wada, all of Kyoto, Japan, assignors to Nishimura Seisakusho Co., Ltd., Kyoto, Japan

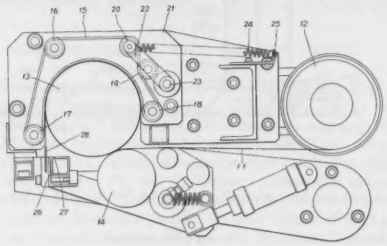
Filed Sept. 6, 1973, Ser. No. 394,842

Claims priority, application Japan, Dec. 12, 1972, 47-106,374

Int. Cl. B65h *19/20*

U.S. Cl. 242—56 R **1 Claim**

1. A film wrapping apparatus comprising a film winding core roller, means for driving said core roller for rotation, an endless belt stretched between a plurality of pulleys, said endless belt being pressed at a stretched portion thereof against said core roller along its peripheral direction so that said endless belt is moved along with said core roller, means for feeding a continuous film in a direction of its continuous length, cutting means for cutting said continuous film at a fixed position during its feeding to form a new leading end of said continuous film, air blowing means located immediately before said cutting means, said air blowing means facing the region where said endless belt contacts the surface of said core roller to introduce said leading end portion of said continuous film between said stretched portion of said endless belt and said core roller at said region, whereby the wrapping of said



film around the peripheral surface of said core roller is automatically initiated with said endless belt and said peripheral surface of said film winding core roller holding the leading end portion of said film therebetween.

3,883,085

ROLL SLITTING AND WINDING MACHINE

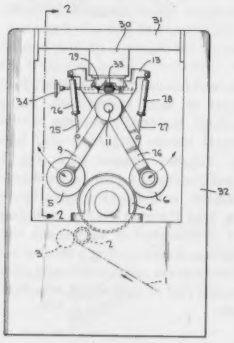
Franz Held, Gross Zimmern, Germany

Filed Oct. 4, 1971, Ser. No. 186,355

Claims priority, application Germany, Oct. 3, 1970, P 20 48 715.4

Int. Cl. B65h *17/00, 35/02*

U.S. Cl. 242—65 **2 Claims**



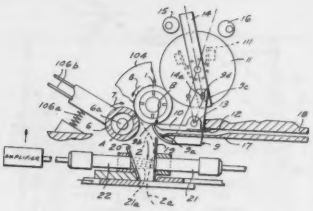
1. Roll cutter and winding machine having spaced side frame members; comprising, at least one winding roll each disposed on opposite sides of a supporting roll for alternately winding up a cut strip from a web passing over said supporting roll, said supporting roll extending between said side frame members, a pair of swivel arms for each of said winding rolls, one of said winding rolls being rotatably mounted between one pair of said arms at one end thereof, the other of said winding rolls being rotatably mounted between the other pair of said arms at one end thereof, at least three adjacent bearing bodies for said winding rolls, a single guide mounting said bearing bodies for adjustable movement in a direction parallel to the axis of said winding rolls, one arm of each said one pair and said other pair of said arms being pivotally mounted at the opposite ends thereof to the middle one of said bearing bodies, and the other arm of each said one pair and said other pair of said arms being pivotally mounted respectively to the outer ones of said bearing bodies.

3,883,086

APPARATUS FOR DETECTING AND GUIDING THE LEADERS OF PHOTOGRAPHIC ROLL FILMS

Helmut Zangenfeind, Puchheim, and Erich Nagel, Anzing, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 252,416, May 11, 1972, Pat. No. 3,642,221. This application Apr. 18, 1974, Ser. No. 462,186
Claims priority, application Germany, May 19, 1971, 2125084
Int. Cl. B65h *17/08, 17/02*
U.S. Cl. 242—65 **11 Claims**



1. Apparatus for intercepting the leader of photographic film which is convoluted on a spool within a convoluted backing strip having a front portion extending beyond the leader, comprising bearing means for rotatably supporting a spool with convoluted film and backing strip thereon; drive means for rotating the spool in said bearing means in a direction to pay out the film and the backing strip; deflector means mounted for engagement with the outermost convolution of said backing strip on the rotating spool and to thus deflect the front portion of said backing strip in a predetermined direction; first guide means defining a first path for the thus deflected front portion of the backing strip; second guide means defining a second path for the leader of the film; blocking means movable to and from and normally assuming an operative position in which the leader of the film is prevented from entering said second path; detector means mounted adjacent to said first path and including means for producing signals in response to detection of the front portion of the backing strip; displacing means operative to move said blocking means from said operative position in response to said signals; and means for orienting a spool in said bearing means in such angular position that the front portion of the backing strip on such spool is located intermediate the point of engagement between the spool and said drive means and the point of engagement between teh spool and said deflector means.

3,883,087

FILM TAKE-UP REEL

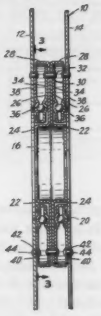
Clifford Van Praag, 264 Dennis St., Oceanside, N.Y. 11572

Filed Feb. 23, 1973, Ser. No. 335,107
Int. Cl. B65h *75/18*
U.S. Cl. 242—71.8 **8 Claims**

1. A motion picture film take-up reel comprising:

a. a rotatably drivable hub member including a central hub portion formed of a pair of complementary halves and being adapted to receive a take-up reel drive spindle of a motion picture projector and form a driving connection therewith; radially extending peripheral flange means extending from said hub portion; cylindrical film-receiving surface means formed at the radially outer end of said flange means upon which said film is adapted to be wound; said pair of complementary halves centrally divided in a radially extending plane, each said half including a half-thickness portion of said peripheral flange means in contiguous surface-to-surface relationship, and fasstener means interconnecting said flange means for fastening together said complementary halves;

b. roller bearing means having first and second races, each including parallel radially extending side wall portions rotatable relative to each about a common axis, one each of said roller bearing means being positioned on each side of said flange means and with the central hub portion extending through a center aperture formed in each of said roller bearing means, further fastener means for fastening the side wall portions of each of said roller bearing means adjacent said flange means to said flange means; and



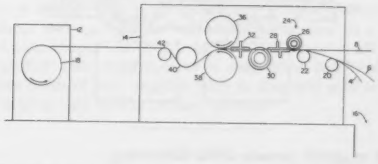
c. a pair of disc-shaped centrally-apertured planar flanges of light-weight material having the radially inner peripheral portion thereof positioned adjacent the axially outer side wall portions of each of said roller bearing means, said planar flanges being rigidly fastened to said side wall portions and being spaced apart a distance slightly greater than the width of the film to be wound on the cylindrical film-receiving surface means, said planar flanges being freely rotatable relative to said hub member and each other.

3,883,088

METHOD AND APPARATUS FOR PROVIDING AND MAINTAINING SEPARATION OF MULTIPLE STRANDS FROM A SLITTING OPERATION

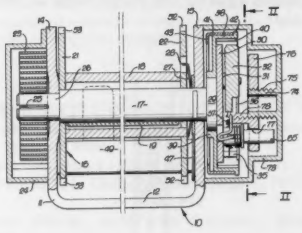
Roger B. Cannon, Muncie, Ind., and Dwight B. Raddatz, Woodridge, Ill., assignors to Ball Corporation, Muncie, Ind.

Filed Nov. 14, 1973, Ser. No. 415,846
Int. Cl. B65h *23/10, 35/02*
U.S. Cl. 242—75.2 **10 Claims**



3. A tension stand having a longitudinal axis and comprising: a first separator means; a second separator means; a first flattening means and a second flattening means, said first separator means being disposed above said longitudinal axis; said second separator means being disposed beneath said longitudinal axis; said first flattening means and said second flattening means being disposed along said longitudinal axis and on opposite sides of said second separator means, said first separator and said second separator being disposed on opposite sides of said first flattener.

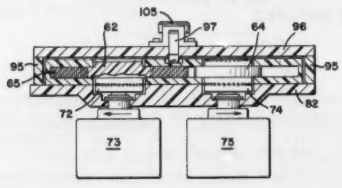
3,883,089
SAFETY BELT DEVICE
Albert R. Close, Sepulveda, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.
Filed Oct. 29, 1973, Ser. No. 410,498
Int. Cl. B65h 75/48
U.S. Cl. 242—107.4 12 Claims



1. In a safety belt retractor having a strap receiving spool mounted for rotation in a frame with said spool being urged into a strap wound position and including a lockbar having at least one locking pawl thereon adapted to engage the teeth of a ratchet tooth gear on the spool, inertia responsive means adapted to engage said lockbar in response to sudden acceleration of said strap off said spool and move said lockbar to cause said pawl to engage with said teeth, the improvement comprising the provision of:

means operatively connected to said spool adapted to block said inertia responsive means thereby for selectively preventing said inertia responsive means for causing said pawl to engage with said teeth upon sudden acceleration of said strap off said spool until a retractive movement of said spool releases said inertia responsive means to thereby cause said pawl to engage with said teeth.

3,883,090
DRIVE FOR MAGNETIC RECORDING DISC OR TAPE CASSETTES
Robert P. Hall, Sr., Auburn, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.
Filed Apr. 24, 1972, Ser. No. 246,636
Int. Cl. G11b 23/10
U.S. Cl. 242—199 5 Claims



1. A magnetic cassette drive comprising,

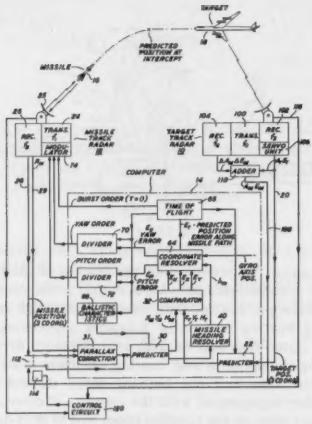
a hollow cassette housing a movable magnetic recording media,

a driven hub rotatably supported in said cassette and connected to move the media,

a driven face on said driven hub including a plurality of circularly arranged radially extending and axially facing teeth, said teeth having undercut driving faces,

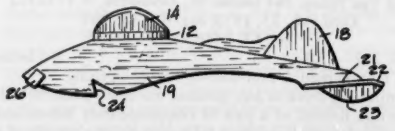
a drive hub separate from said cassette and having a drive face which is the complement of said driven hub, means connected to rotate said drive hub such that its undercut driving faces are foremost in the direction of rotation; and means supporting said cassette and said drive hub to bring said faces into contact to cause a locking engagement of the hubs during rotation thereof.

3,883,091
GUIDED MISSILE CONTROL SYSTEMS
Jacob W. Schaefer, Watchung, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed July 30, 1956, Ser. No. 600,858
Int. Cl. F41g 9/00, 11/00, 7/14
U.S. Cl. 244—3.13 7 Claims



1. In an antiaircraft system, target tracking means for continuously establishing the position of a target aircraft in space, missile tracking means for similarly establishing the position of a missile, computing means responsive to position information from both said target and missile tracking means to produce control signals for said missile to insure interception of the target thereby and means for substituting the target tracking means for said missile tracking means as a source of missile position information for said computing means during the final phases of an engagement.

3,883,092
GLIDER
Ralph L. Ditto, 2205 Paul Minnie, Santa Cruz, Calif. 95062
Filed Nov. 14, 1973, Ser. No. 415,807
Int. Cl. B64c 31/02; A63h 27/00
U.S. Cl. 244—16 4 Claims



1. A glider having a fuselage connected below a wing assembly including a continuous surface wing construction comprising right and left centerwing portions and right and left wingtip portions, each of said centerwing portions having positive dihedral with respect to a horizontal plane and said wingtip portions having positive dihedral with respect to said horizontal plane that is twice that of said centerwing portions; and

a first vertical stabilizer extending above said fuselage and a second vertical stabilizer extending below the fuselage behind said first stabilizer, and a horizontal stabilizer disposed aft of said first stabilizer and intersecting the

second vertical stabilizer and disposed in a plane below a line through the apex of said wing construction parallel to the longitudinal axis of said fuselage.

3,883,093

AIRCRAFT CONTROL ELEMENTS

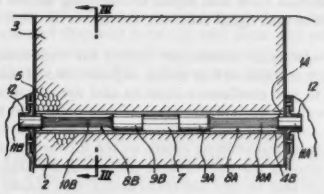
André Violleau, Vitrolles-le-Roucas, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Feb. 2, 1972, Ser. No. 222,837

Claims priority, application France, Feb. 11, 1971, 71.04579

Int. Cl. B64c *9/02*

U.S. Cl. 244—42 D **14 Claims**



1. In an aircraft control element attached to an aircraft structure comprising at least one flap pivoting around an axis parallel to its span, the improvement that the flap is rigidly secured to a longitudinal portion of at least two symmetrically, axially disposed elongated torsion elements, another longitudinal portion of each such element being separate from the first portion and rigidly secured to the aircraft structure.

3,883,094

FOLDABLE CANARD ASSEMBLY

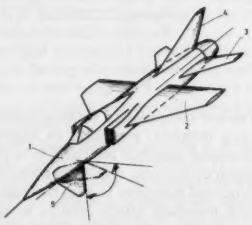
Andreas Mederer, Markt Schwaben, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Nov. 1, 1973, Ser. No. 412,047

Claims priority, application Germany, Nov. 4, 1972, 2254136

Int. Cl. B64c *5/04*

U.S. Cl. 244—45 A **6 Claims**



1. A foldable canard assembly for an aircraft having a fuselage, a main aerodynamic wing mounted on the mid section of said fuselage of said aircraft and a vertical tail assembly and a horizontal elevator assembly mounted on the aft section of said fuselage of said aircraft, comprising:

a pair of equally sized and separate canards mounted on the forward section and each having means defining an airfoil thereon; and

a pair of pivot means mounted on said aircraft fuselage forward of said main wing and defining a pair of pivot axes extending parallel to the longitudinal axis of said aircraft for pivotally securing said pair of separate canards to said aircraft, said pair of separate canards being pivotal between a first position wherein said canards both extend vertically downward from said aircraft fuselage and a second position wherein both of said canards extend horizontally and generally tangent to the lower surface of said forward section of said aircraft fuselage, said canards, when in said first position, extending in a parallel and contacting relation along their length so that said pair of vertically extending airfoils together define a single airfoil.

3,883,095

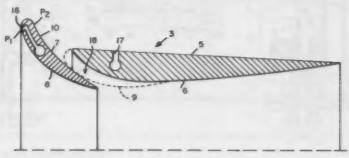
REVERSED COWL FLAP INLET THRUST AUGMENTOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Dah Yu Cheng, Palo Alto, Calif.

Filed Sept. 19, 1973, Ser. No. 398,886

Int. Cl. B64d *33/00*

U.S. Cl. 244—53 B **9 Claims**



1. In a jet engine assembly, an apparatus for providing thrust augmentation in a forward direction comprising:

a controlled movable airfoil having upstream and downstream surfaces relative to said forward direction for entraining external air into the interior of said jet engine assembly and developing a thrust component along said direction of motion; and

servo means for constantly moving said airfoil to a position that generates maximum thrust augmentation.

3,883,096

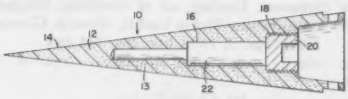
TRANSPIRATION COOLED NOSE CONE

Irving B. Osofsky, Rancho Plaos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 12, 1974, Ser. No. 450,537

Int. Cl. B64c *1/38*

U.S. Cl. 244—117 A **6 Claims**



1. A missile nose cone comprising a cone shaped body member thàt has an outer surface that is tapered to a point, said cone shaped member being made of tungsten alloy impregnated with solid coolant is embedded and contained within pores of said tungsten alloy so that said solid coolant material of said boiling coolant material.

3,883,097

DEVICE FOR PICKING UP AND EJECTING LOADS UNDER AN AIRPLANE

Jean Billot, Levallois, France, assignor to Rafaut & Cie, Villeneuve La Garenne, France

Filed Dec. 10, 1973, Ser. No. 423,351

Claims priority, application France, Mar. 27, 1973, 73.10960

Int. Cl. B64c *1/22*

U.S. Cl. 244—137 R **5 Claims**

1. A device for carrying and ejecting a load under an airplane, the load being formed with recesses in its surface, said

device being housed within a girder of the airplane and comprising two carrying and ejecting assemblies and a single ejection controlling means for operating both carrying and ejecting assemblies,

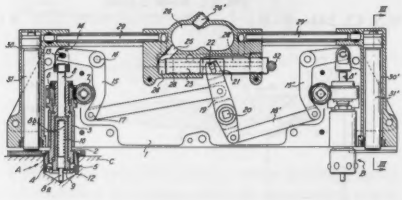
said unique ejection controlling means comprising:

a cylinder and a piston movable within said cylinder,

controllable means for introducing gas under pressure into said cylinder so as to move said piston,

a lever mechanically coupled to said piston and pivotally mounted on an axis fixed with respect to the airplane, said lever being pivoted around said axis upon movement of said piston in said cylinder, and

each carrying and ejecting assembly comprising:



supporting means, cooperable with an abutment surface of a recess in the load, for supporting the load, said supporting means comprising a sleeve insertable into the recess and actuatable locking and releasing means carried by said sleeve for locking the load to or releasing the load from the supporting means,

a mechanical linkage connecting said lever to said actuatable locking and releasing means, for actuating said locking-releasing means upon movement of said piston, and

lifting means for lifting both said supporting means and said load when said supporting means are engaged in said recess of the load, so as to fasten said load against the girder of the airplane and maintain it steady during flight of the air-plane.

3,883,098

ARRANGEMENT FOR GUIDING TOGETHER OF TWO TRAFFIC STREAMS

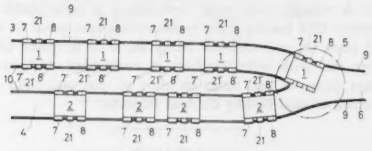
Walter Hermann, Weissenfeld; Peter Kraus, Munich, and Gunter Steinmetz, Grafing, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Sept. 5, 1973, Ser. No. 394,469

Claims priority, application Germany, Sept. 6, 1972, 2243679

Int. Cl. B61l *3/00*

U.S. Cl. 246—167 R **16 Claims**



1. In an arrangement for merging moving objects travelling in single file along respective ones of at least a pair of paths toward a confluence point at which the paths merge, said arrangement including control means mounted on each of said objects for controlling the speed of each object and spacing the objects, said control means comprising signal transmitting means and signal receiving means on each object, a signal transmitted by said signal transmitting means in one object on one path being received by said signal receiving means in the next object on said path, the improvement comprising:

stationary signal transmission line means extending coextensively with each of said paths prior to said confluence point, said signal transmission line means comprising electrical signal transmitting conductor means and first electrical connection means for effecting a higher than normal attenuation of said electrical signal in a longitudinal direction along said electrical signal transmitting conductor means so that the amplitude of said electrical signal transmitted over said electrical signal transmitting conductor means will be diminished in said longitudinal direction;

coupling means for coupling said signal transmitting means and said signal receiving means on each of said objects to said signal transmission line means so that signals can be transmitted from said signal transmitting means on one object to said signal receiving means on the next object; and

second electrical connection means for connecting said signal transmission line means adjacent one of said paths prior to said confluence point to said signal transmission line means adjacent the other of said paths also prior to said confluence point whereby a signal transmitted by said signal transmitting means on the forwardmost one of said objects on one of said paths will be transmitted through said second electrical connection means to said signal receiving means on the next following object on the other of said paths.

3,883,099

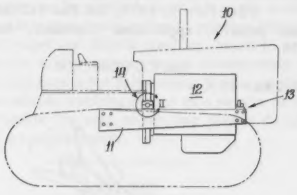
RESILIENT ENGINE MOUNT WITH SELF-LOCATING MEANS

Arthur D. Hermann, Chillicothe, and Edwin L. Riedesel, East Peoria, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Feb. 14, 1974, Ser. No. 442,465

Int. Cl. F16m *5/00*

U.S. Cl. 248—9 **9 Claims**



1. In an engine mount comprising a resilient bushing assembly, including a cup member, mounting an engine support trunnion on a structural member attached to a frame of a vehicle, the invention comprising stop-means secured on one of said cup and structural members to abut the other member for positioning such members axially relative to each other, said stop means comprising an annular flange formed integrally on said cup member and extending radially outwardly into abutting relationship with an outboard side of said structural member.

3,883,100

RESILIENT ENGINE MOUNT AND ALIGNMENT MEANS AND METHOD THEREFOR

Arthur D. Hermann, Chillicothe; William C. Hurt, II, Brimfield, and Bruce W. Miers, Peoria Heights, all of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

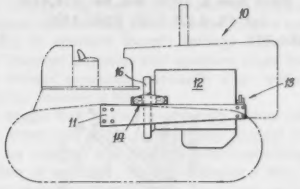
Filed Feb. 14, 1974, Ser. No. 442,466

Int. Cl. F16m *5/00;* **F16f** *15/00*

U.S. Cl. 248—9 **13 Claims**

1. A resilient engine mount releasably mounting an engine on a frame of a vehicle comprising a bracket, fastening means attaching said bracket to said engine and a pair of resilient

bushing assemblies, disposed on either side of said fastening means, mounting said bracket on said frame, said bracket comprising a vertically disposed plate and a mounting block



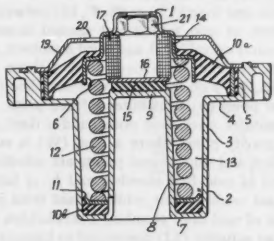
mounted on top of said frame and secured to a back side of said plate and disposed between said plate and said engine, said fastening means extending through said plate and mounting block and attached to a side of said engine.

3,883,101

VIBRATION DAMPING MEANS

Pierre Vernier, Lausanne, Switzerland, assignor to ARFINA Anstalt Fuer Continentale und Uebersee Finanzinteressen, Vaduz, Liechtenstein

Filed July 15, 1974, Ser. No. 488,768
Int. Cl. E02d *27/44*; **F16m** *5/00*; **F16f** *15/00*
U.S. Cl. 248—9 **7 Claims**



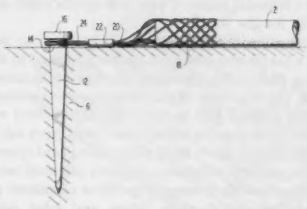
1. Vibration damping means which comprises:
a first rigid member (1) adapted to be attached to one of two members to be damped;
a second rigid member (2) coaxial with the first rigid member and having the shape of a cylindrical cup, with a peripheral wall portion (5) at its open end which is radially spaced from a corresponding wall portion (6) of the rigid member (1);
said second rigid member having a projection (8) which extends upward from its bottom (7) in the form of an inner cup coaxial with the cylindrical wall (3) of the rigid member to define a substantially annular intermediate chamber (13) therebetween, said upward projection (8) having itself an inner bottom (9);
a pad of knitted metallic wire (17) between said first rigid member (1) and said inner bottom (9) which acts in the axial direction;
a first elastomeric pad (10) positioned between the radially spaced zones (5), (6) of the two rigid members (1), (2) to act in shear;
a helical spring (12) positioned in the annular space (13) and bearing on the first rigid member (11) and on the annular bottom (9) of the second rigid member (2);
a second annular elastomeric pad (10) positioned between the bottom (7) of the second rigid member (2) and the end of the spring (12);
and
a third elastomeric pad (15) between the inner bottom (9) of the projection (8) and the knitted metallic wire pad (17).

3,883,102

TIE-DOWN FOR TRAFFIC COUNTER HOSE

Harry E. Trigg, Hampton, Va., assignor to International Transportation Service Company, Hampton, Va.

Filed Aug. 13, 1973, Ser. No. 387,739
Int. Cl. F16g *11/00*; **G08g** *1/00*
U.S. Cl. 248—75 **1 Claim**



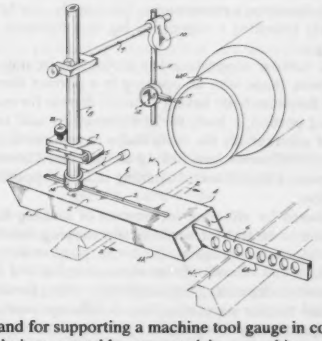
1. A tie down for the free end of a traffic counter hose comprising
a piton adapted to be driven into the pavement of a roadway and comprising
a body adapted to be driven into a roadway,
a cylindrical neck on the top of said body surmounted by a cylindrical head,
a Chinese finger trap engageable over a free end of said hose, said finger trap having
strands formed with a loop, said loop engaging around said neck and being normally barred from dislodgement from said neck by said head save by manipulative distortion of the loop,
said body being substantially flat and of generally triangular shape with a pointed lower end and a comparatively wide upper end from which said neck projects upwardly, the diameter of said neck being substantially equal to the thickness of the body and the diameter of the head being substantially greater than the diameter of the neck.

3,883,103

STAND FOR MACHINE TOOL GAUGE

Albert F. Bartolat, 61071 Hwy. 97, Bend, Oreg. 97701

Filed Jan. 2, 1974, Ser. No. 430,245
Int. Cl. A47g *19/00*
U.S. Cl. 248—124 **1 Claim**



1. In a stand for supporting a machine tool gauge in contact with a workpiece rotatably supported in a machine tool to determine the concentricity of the mounted workpiece, the stand including a mast, an arm extending outwardly from the mast, an indicator supported by said arm and having a feeler in contact with the workpiece, the improvement comprising, a base of elongate inverted channel formation of substantial

mass having downwardly extending sidewalls extending substantially the length of the base and constituting base leg members, said sidewalls tapered in a downward direction and terminating in a pair of parallel coplanar bottom edges each of reduced surface area of relatively heavy surface loading when in rested contact with the machine tool,

an arm projecting outwardly from one end of said base and having a flat bottom edge coplanar with the bottom edges of said sidewalls, said flat bottom edge of the arm constituting a third edge for support of the base on the machine tool in a tripodal manner, said arm additionally serving as a handle for the stand,

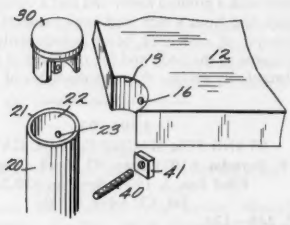
means mounting the lower end of the mast to said base within a lengthwise oriented opening formed in the latter enabling positioning the mast transversely relative to the axes of the rotatable workpiece, said mounting means including a hand grip in threaded attachment with said mast for advancement toward and away from said base to lock and unlock the mast in place along said opening, and said base and arm adapted to support the mast and indicator in an immobile manner regardless of minute particles intermediate said bottom edges and edge supporting machine tool surfaces.

3,883,104

TABLE LEG FASTENING MEANS

Fredrick B. Delafield, Altavista, Va., assignor to The Lane Company, Inc., Altavista, Va.

Filed Mar. 6, 1974, Ser. No. 448,714
Int. Cl. A47b *3/06*
U.S. Cl. 248—188 **8 Claims**



1. In furniture a combination for quickly, aesthetically, and securely attaching a supporting leg to a furniture body comprising

a. a tubular supporting leg having a circumference of a given shape with an opening in a portion thereof,

b. a furniture body having a cutout therein for receiving said leg portion, a body surface formed by said cutout being of substantially the same shape as said portion of said leg circumference and having an aperture therein for communication with said opening in said supporting leg portion,

c. means for effecting securement of said leg to said furniture body and for aesthetically capping said tubular leg, said means including (i) a cap portion for capping an open end of said tubular supporting leg and (ii) a flange portion depending from said cap portion for insertion into said tubular supporting leg, said flange portion having a rim for supporting said cap portion on said tubular leg, and

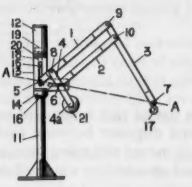
d. fastening means extending from said flange portion through said leg opening and said aperture in said body surface formed in said cutout for holding said securing and capping means, leg, and furniture body securely together in said surface to surface contact.

3,883,105

LOAD HANDLING EQUIPMENT

Reizou Matsumoto, 3-63, 4-chome, Imahuku-minami, Johtoh-ku, Osaka, Japan

Filed June 5, 1974, Ser. No. 476,415
Int. Cl. A47f *5/00;* **B66d** *1/00*
U.S. Cl. 248—281 **11 Claims**



1. A load handling equipment comprising a pantograph having two pairs of parallel members (1 – 2; 3 – 4, 4*a*, 4′) facing each other and forming a parallelogram; pivotal connections (9; 6, 6′; 8, 8′; 10) between said members, including a first pivot (9) between first ends of a first (1) and a third (3) member, a second pivot (6, 6′) at least axially aligned with a second member (2) and the first end of a fourth member (4, 4*a*, 4′), and third and fourth pivots (8, 8′, 10) between respective second ends of said fourth and second members and intermediate points on said first and third members; an imaginary telescopic constant-ratio lever having three predetermined points (5, 6, 7) on the same imaginary line (A — A), of which a first point (5) constitutes a force point, a second point (6) constitutes a reaction point, and a third point (7) constitutes a gravity point where a load (W) is suspended, wherein said first and said second points are selectively a/ at the second end of said first member and *b*/ at least axially aligned with said second pivot, while *c*/ said third point is at the second end of said third member; a mechanism including a ram (18) of an actuator (12) connected to balance the load; and a second mechanism including means for limiting the movement of said force point to the vertical direction, means for horizontally moving said reaction point, and means for proportionately deriving a two-dimensional movement for said third point.

3,883,106

TELESCOPING POST

Ole Finn Simonsen, Baie D'Urfe, Quebec, Canada, assignor to Dominion Bridge Company Limited, Montreal, Quebec, Canada

Filed July 24, 1973, Ser. No. 382,209
Claims priority, application Canada, May 14, 1973, 171308
Int. Cl. E04g *25/08*
U.S. Cl. 248—354 R **1 Claim**

1. An infinitely adjustable telescoping post for extending between vertically spaced apart floors in a building under construction for use as a fence post in a temporary safety fence which also includes a plurality of panels having an upper rail and a middle rail, said telescoping post comprising

a first post member having an elongated, rigid hollow body defining an internal rectilinear passage of constant cross-section;

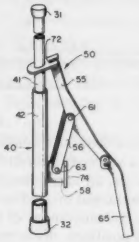
a section post member having an elongated rigid body, one end portion of which having a constant cross-section and outer dimensions adapted to fit relatively closely in slidable telescoping relationship within said passage of said first post member;

a lug rigidly attached to said first post member and extending outwardly therefrom;

a locking means for retaining said first and second post members into extended telescoping relationship when said telescoping post is subjected to longitudinal compression, said locking means comprising an aperture plate having an aperture therein through which said second post member extends, said aperture plate having a portion thereof extending outwardly from said second post member forming a boss;

a first toggle link having a generally compressed S-shape with inner and outer substantially straight end portions and an integral mid portion interconnecting each end protion at an angle, thereby forming a first boss at the interconnection between the inner end portion and the mid portion and a second boss at the interconnection between the outer end portion and the mid portion, said first toggle link being pivotably connected at the inner end portion thereof to said aperture plate boss at a first pivot point a transverse distance from said second post member;

a second toggle link pivotably connected at one end thereof to said first boss at a second pivot point and pivotably connected at the other end to said lug at a third pivot point a transverse distance from said first post member, said outer end portion of said first toggle link comprising



a handle extending along said second toggle link but slightly spaced therefrom so as to facilitate actuation of said locking means and for retaining the upper rail of the safety fence in position, the actuation of the locking means being effected by urging said handle toward said telescoping post for locking same and away from said telescoping post for releasing said second post member relative to said first post member whereby said toggle links are operable between a released position to a locking position, and when is said locking position said second pivot point is closer to said telescoping post than either said first or third pivot points thereby producing a toggle effect for holding the locking means in the locked position, and further when in said locking position, one side of said apertured plate is urged away from said lug along the axis of said telescoping post thereby to prevent sliding of said second post member within said passage when said telescoping post is subjected to longitudinal compression; a relatively thick boot mounted on each end of said telescoping post, said boots made of rubber-like resilient material for facilitating the positioning of said locking means in the locked position and for acting as friction elements;

hook means operable to interconnect said toogle links and said first post member when said locking means is in the locking position whereby to prevent accidental release; and

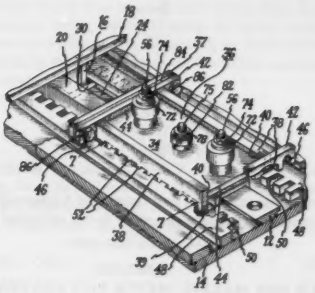
a bracket rigidly mounted on said first post member for supporting the middle rail of the safety fence.

3,883,107

LOAD CARRYING BED WITH ADJUSTABLE ANCHOR

Otis W. Ashworth, and Gordon C. Holden, both of Rome, Ga., assignors to General Electric Company

Filed Nov. 1, 1973, Ser. No. 411,695
Int. Cl. B60p 7/08; B65j 1/22
U.S. Cl. 105—367 **7 Claims**



1. Apparatus for anchoring a load to a loadbed comprising:

a. a rail member fixedly attached to a loadbed;

b. a T-shaped structure formed of first and second plate-like portions, an edge of said first plate-like portion being attached to a face of said second plate-like portion intermediate of the ends of said second plate-like portion such that said first and second plate-like portions are in a generally orthogonal relationship, an edge of said first plate-like portion opposite from the attached edge of said first plate-like portion being attached to the base of said load;

c. a hold down member slidably attached to said rail member having a T-shaped upper channel portion extending in the direction of the longitudinal axis of said rail member, engageable with said T-shaped load attached structure;

d. a shim member insertable between the surface of said second plate-like portion that is attached to an edge of said first plate-like portion and an adjacent surface of said upper channel portion of said hold down member, to urge said load attached T-shaped structure toward said rail member into an anchored position, and to urge said lip portion of the channeled bottom of said hold down member into non-sliding engagement with the undercut side portions of said rail member; and

e. means for preventing movement of said hold down member longitudinal of said rail member.

3,883,108

EASEL

Joseph Swartz, 2908 McDonald, Midland, Tex. 79701

Filed Mar. 29, 1973, Ser. No. 346,151
Int. Cl. A47b 97/04
U.S. Cl. 248—460 **6 Claims**

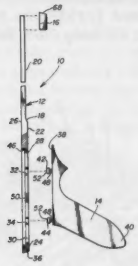
1. An easel for supporting an object in a frame comprising:

a. a standard having a first side carrying a vertical recess and adapted for abutting engagement with the rear of said frame, a second side opposite said first side, and a vertical slot communicating between said vertical recess and said second side;

b. prop means having a front edge adapted to engage said second side of the standard; and

c. locking means fixedly mounted on said prop means and having a shank portion of a width less than the width of said slot and a length greater than the depth of said slot and an enlarged head fixedly secured to said shank with at least one dimension greater than the width of said slot

but less than the width of said recess such that said prop means can be slidably positioned relative to said standard



to adjust said easel and thereafter frictionally engage the standard to secure the easel in the adjusted position.

3,883,109

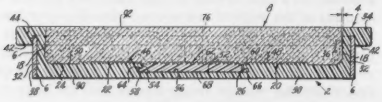
MOLD FOR MAKING METER BOX COVERS AND THE LIKE

Walter B. Hahne, Costa Mesa, Calif., assignor to Pre-Cast Concrete Products, Limited, Santa Ana, Calif.

Continuation of Ser. No. 673,444, Oct. 6, 1967, abandoned. This application June 23, 1970, Ser. No. 56,040

Int. Cl. B29c *5/00*

U.S. Cl. 249—91 **8 Claims**



6. A mold for casting objects from a concrete mix or the like, comprising: a flexible plastic tray for receiving said mix, said tray having a bottom wall and side walls extending upwardly therefrom, the upper surface of said bottom wall containing a recess having an inwardly directed marginal flange extending throughout its periphery; and an insert disposed in said recess and having a peripheral flange engaged with said inwardly directed marginal flange to demountably retain said insert in said recess, said insert being readily removable upon flexing of the bottom wall of said tray.

3,883,110

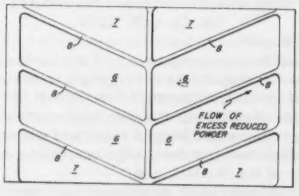
BRIQUETTE MOLD POCKET CONFIGURATION

Luther G. Hendrickson, Churchill Borough, and Dino Ravasio, McKeesport, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed June 28, 1974, Ser. No. 483,997

Int. Cl. B29d *7/14*; **B30b** *3/00*

U.S. Cl. 249—187 **4 Claims**



1. A mold segment for use in a tandem roll briquette machine comprising a body portion adapted for inclusion on the periphery of a mold roll, and a plurality of mold pockets arranged in a V-formation extending from a central vertical land area.

3,883,111

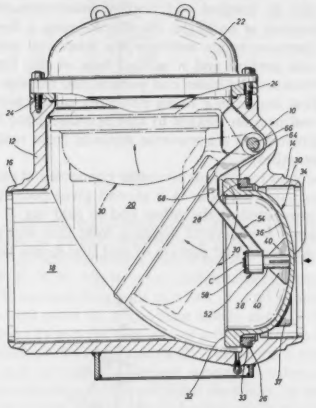
CLAPPER-TYPE CHECK VALVE

Jerry W. Jourdan, Alvin, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sept. 24, 1973, Ser. No. 400,454

Int. Cl. F16k *31/52*

U.S. Cl. 251—82 **7 Claims**



1. A check valve structure comprising, a valve body having a flow passage, a valve seat about the flow passage, a clapper type valve member, an arm connected to said valve member, a support shaft mounted on said body and fixed to said arm to support the arm for movement of the valve member between open and closed positions, drive means engaging said shaft for raising the valve member from the closed position to open position and maintaining said valve member in open position when rotated in one direction, said drive means permitting the valve member to move by gravity from an open position to a closed position when rotated in an opposite direction, said drive means permitting the valve member when in a closed position to swing freely in one direction to an open position relative to said drive means so that said valve member may open freely from a closed position without the actuation of said drive means.

3,883,112

PLUG VALVE HAVING COMPOSITE SEAT ELEMENT

Bertram J. Milleville, Pittsburgh, Pa.; Herman H. Fowler, Kearney, Nebr., and John H. Fowler, Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

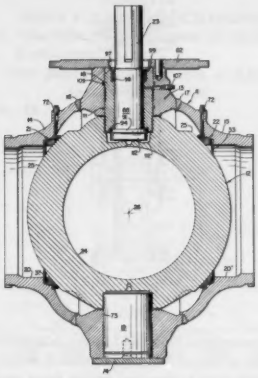
Filed Feb. 2, 1973, Ser. No. 328,915

Int. Cl. F16k *5/06*

U.S. Cl. 251—174 **11 Claims**

1. In a plug valve of the type wherein a ported plug is rotatably mounted in a valve body for movement between a valve closed position wherein it blocks a fluid passage through the valve and a valve open position wherein the plug port becomes a continuation of the body passage, seat rings mounted in said body surrounding passage openings at opposite sides of the plug and having spherical surface means adapted for engaging corresponding spherical surface means on said plug during rotation of the plug between said positions, at least one of said seat rings being a composite seat ring comprising a metal annulus having an axis parallel with the fluid passage and formed with said spherical surface means and an annular groove extending in a direction normal to the axis of said consisting essentially of a flat sided relatively narrow annulus

of synthetic plastic material, said annulus having a substantially greater width than thickness and laying in width in a plane normal to the axis of the annulus, said annulus having



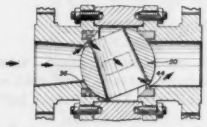
its outer periphery fixed in said annular groove and its innere periphery projecting from said metal seat ring into deformable pressure engagement with said surface means of the plug.

3,883,113

FLUID CONTROL BALL VALVE STRUCTURE FOR THROTTLING SERVICE

John P. Kolb, Stafford, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,084
Int. Cl. F16k *5/06*
U.S. Cl. 251—209 **5 Claims**



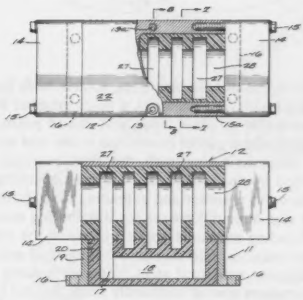
1. A fluid control ball valve structure comprising a valve body having a valve chamber, upstream and downstream flow passages formed in said valve body and being in fluid communication with the valve chamber, a ball member disposed within the valve chamber and having a bore therethrough, means to rotate the ball member about a fixed axis of rotation between an open position in which the bore is in axial alignment with the flow passages and a closed position in which the bore is positioned generally at a right angle to the flow passages, an annular upstream seat member about the upstream flow passage and an annular downstream seat member about the downstream flow passage, the bore through said ball member having an entrance port adjacent the upstream seat member and an exit port adjacent the downstream seat member, and a circumferential upstream edge portion on said ball member defining the entrance port and having a generally arcuate indentation therein positioned on the circumferential segment of the edge portion initially clearing the upstream seat member upon rotation of the ball member from fully closed position toward open position, said arcuate indentation being struck from a generally constant radius which is positioned generally along a horizontal plane extending through the centerline of the flow passage with the surface formed by the indentation being beveled along its lateral edges, said indentation upon being exposed initially to fluid flow increasing substantially the flow area upon the initial opening of the valve member.

3,883,114

VALVE BODY

Bernard Harris, Bayside; Russell P. Johnson, and Gerald G. Lambert, both of Milwaukee, all of Wis., assignors to Rexnord, Inc., Milwaukee, Wis.

Filed Mar. 26, 1973, Ser. No. 345,019
Int. Cl.² F16K *11/07*
U.S. Cl. 251—366 **12 Claims**



1. In an air valve comprising:

a. a cast valve body formed of resin mixed with metal powder;

b. a metal outer shell surrounding said cast valve body; and

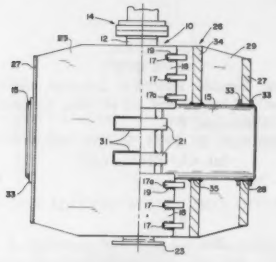
c. a plurality of ports and internal passages communicating with said ports, said ports including inner portions formed in said cast valve body and outer portions formed in said metal outer shell.

the improvement comprising an elastomeric layer disposed between said cast valve body and said metal outer shell and bonding them together, said elastomeric layer being of sufficient thickness to accommodate the differences in thermal expansion and contraction between said cast valve body and said metal outer shell due to their different compositions and extending to the peripheries of said ports between said inner and outer portions thereof, thereby providing an air seal around said ports which prevents leakage of air from one of said ports, between said cast valve body and said metal outer shell, and into another of said ports.

7. In an air valve, a valve body comprising a cast inner member formed of resin mixed with metal powder and a metal outer shell, said valve body having a number of ports and internal passages communicating with said ports, said ports including inner portions formed in the cast inner member and outer portions formed in the shell, and an elastomeric layer disposed between said cast inner member and said metal outer shell and bonding them together, said elastomeric layer being of sufficient thickness to accommodate the differences in thermal expansion and contraction between the inner member and shell due to their different compositions and extending to the peripheries of the ports between said inner and outer

portions, thereby providing an air seal arouond the ports which prevents leakage of air from one port to between the inner member and the shell and into another port.

3,883,115
VALVE APPARATUS FOR PIPE LINES
Marvin H. Grove, Houston, Tex., assignor to M & J Valve Company, Houston, Tex.
Filed Sept. 14, 1973, Ser. No. 397,437
Int. Cl. F16k *27/10*
U.S. Cl. 251—366 **6 Claims**



1. In valve apparatus for pipe lines, a valve body having end walls provided with flow passages, a valve member within the body and movable between open and closed positions, pipe sections or transition pieces connected to the end walls of the body and communicating with the flow passages, bonnet means carried by one end of the body, an operating rod secured to the valve member and extending through the bonnet means and supplemental means for distributing stresses produced by bending moments applied between the valve body and the pipe sections, said means including rigid and substantially rectangular structural steel plates embracing the pipe sections at regions spaced outwardly from the end walls, and parallel structural side plates disposed along the sides of the valve body and rigidly secured to parallel side edges of the first named steel plates, said structural steel plates and said structural side plates forming a rectangular prism.

3,883,116
SPRING CLAMP TOOL FOR SERVICING SHOCK ABSORBERS
Jerry M. Buccino, 2034 Pelham Ave., Los Angeles, Calif. 90025
Filed Sept. 16, 1974, Ser. No. 506,529
Int. Cl. B60p *1/00*
U.S. Cl. 254—10.5 **1 Claim**

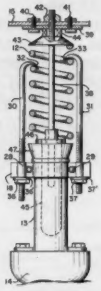
1. A spring clamp tool for servicing shock absorbers wherein the shock absorber is surrounded by a coiled spring extending between a lower casing and upper frame portion on a vehicle, said clamp tool including:

a. first and second clamp members each in the form of a bar shaped to define a central semi-circular portion and outer smaller semi-circular portions on either side of the central portion;

b. bolt and nut means for securing the bars together in opposed relationship with the central portions positioned about said casing so that said members are clamped to the casing, the outer smaller semi-circular portions defining openings on either side of the casing;

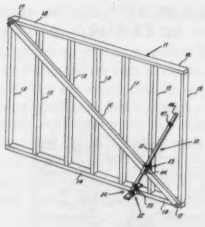
c. first and second elongated rods passing through said openings on either side of said casing to extend upwardly exterior of the coiled spring, the upper ends of the rods terminating in hooks for engaging the spring at diametrically opposite sides, the lower portions of the rods extending through the openings being threaded; and,

d. nuts threaded on the lower ends of the rods such that tightening of the nuts pulls the rods through the openings to retract the coiled spring whereby said shock absorber



may be uncoupled from said upper portion and from said casing for removal and replacements without having to disassemble said casing and spring from said vehicle.

3,883,117
DEVICE FOR SQUARING THE STUDS AND PLATE MEMBERS OF A WALL SECTION
Earl A. Powell, 1030 Fifth St., West Des Moines, Iowa 50265
Filed Oct. 19, 1973, Ser. No. 407,805
Int. Cl. B66f *11/00, 15/00, 3/00*
U.S. Cl. 254—16 **7 Claims**



1. A jack device for squaring a wooden wall section having floor and ceiling plates interconnected by stud members and a brace member loosely attached to diagonally opposite end portions of said section, said device comprising:

a. an elongated lever member,

b. a pair of clamp assemblies of an inverted U-shape, with a first one of said assemblies corresponding to said floor plate, and the second one of said assemblies corresponding to said brace member, each of said clamp assemblies including a pair of oppositely arranged clamp arms,

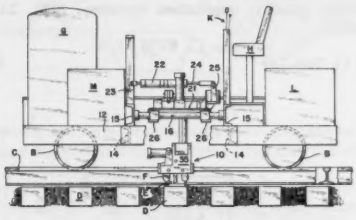
c. means pivotally supporting a clamp arm of said first clamp assembly adjacent one end of said lever member for pivotal movement about an axis extended transversely of the lever member, and other means pivotally supporting the opposite arm of said first clamp assembly for pivotal movement about an axis parallel to the axis of said lever member, and

d. means mounting the second clamp assembly on one clamp arm thereof for longitudinal movement relative to the lever member and for rotational movement about the axis of the lever member,

e. said lever member, when the floor plate is received within the first clamp assembly and the brace member is received within the second clamp assembly, being manually pivoted relative to the first clamp assembly about said transverse axis to a position wherein the stud members

and plate members of the wooden wall section are extended in planes normal to each other.

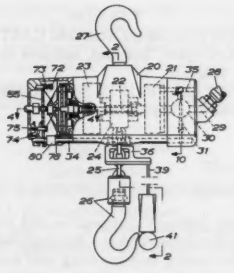
3,883,118
SPIKE PULLING MECHANISM
J. R. Miller, Charlotte, N.C., assignor to Southern Railway Company, Washington, D.C.
Filed June 3, 1974, Ser. No. 475,923
Int. Cl. B25c *11/00*
U.S. Cl. 254—18 **12 Claims**



1. In a railroad spike pulling machine, a spike puller head comprising: a rigid frame; a pair of arms respectively pivoted to said frame for swinging movement in a common plane about parallel axes; said arms including relatively horizontally opposed spike gripping jaws at locations remote from their said axes; power means interconnecting said arms for selectively urging their said gripping jaws toward and away from each other;

and a central gripping element in the form of a pendant arm freely swingably suspended at its upper end from said frame, said pendant arm having gripping jaws at its lower end between and in horizontal alignment with said gripping jaws of said first mentioned arms for substantially horizontal free movement between said gripping jaws of said first mentioned arms.

3,883,119
HOIST
Gunnar Christer Hansson, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Sept. 8, 1972, Ser. No. 287,368
Int. Cl. B66d *1/58*
U.S. Cl. 254—168 **22 Claims**



1. A hoist comprising:

a housing with a reversible motor therein;

a drum in said housing and carrying a flexible line having a fastening means from which a load can be suspended;

a power transmission train in the housing and coupled to said motor to rotate said drum;

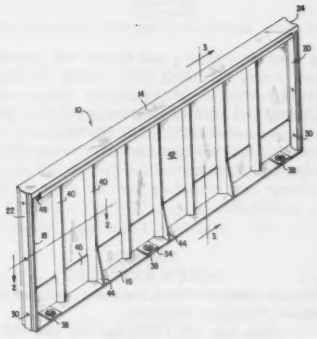
a friction brake means for selectively locking said drum;

a mechanism responsive to a tendency of load driven turning of said drum to force said brake means into a braking position when said motor is stopped so as to form an automatic one-way clutch together with said brake means;

an elastically yieldable means associated with at least one of said mechanism and said brake means for limiting the operating force applied to said brake means by said mechanism whereby to limit the braking force and permit a slipping in said one-way clutch when the tension in the flexible line exceeds a predetermined value; and

means separate from the power transmission train to selectively release said brake means so as to permit the drum to rotate in the load-lowering direction.

3,883,120
MONOLITHIC DASHER-BOARD FOR SKATING RINKS
Joseph R. Tippmann, 211 West St., New Haven, Ind. 46774
Continuation-in-part of Ser. No. 276,948, Aug. 1, 1972. This application June 18, 1973, Ser. No. 370,828
Int. Cl. E04h *17/16*
U.S. Cl. 256—24 **16 Claims**



1. In a dasher-board for skating rinks comprising:

a. a unitary panel member of polyester resinous material having fiberglass incorporated therein and forming a substantially flat front portion, said front portion having an upper and lower marginal edge portion extending outwardly therefrom and a first and second marginal edge portion extending outwardly from said front portion adjacent said upper and lower edge portions to form a continuous and homogeneous reinforcing flange around said front portion,

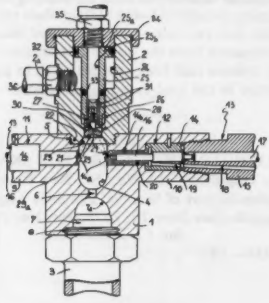
b. additional means adjacent said lower marginal edge portion to absorb the impact of hockey pucks and the like, said additional means being integrally formed with said front portion and made of said aforementioned material, and

c. channel means carried on said panel member for supporting a spectator shield.

3,883,121
PROCESS FOR MIXING TWO OR MORE LIQUID OR PASTRY PRODUCTS UNDER HIGH PRESSURE AND MIXING HEAD THEREFOR
Michel Pierre Guillaud, Grenoble, France, assignor to Societe Anonyme, Secmer la Tronche, Isere, France
Filed Sept. 4, 1973, Ser. No. 394,100
Claims priority, application France, Sept. 6, 1972, 72.32065
Int. Cl. B01f *5/10, 15/02*
U.S. Cl. 259—4 **6 Claims**

1. A head for mixing multiple liquid products introduced thereinto under pressure, comprising:

a body including therein a cavity having a central portion and having respective first and second concavely shaped end portions separated from each other along the axis of the cavity by said central portion, and said body further having a chamber located adjacent to said first end portion and communicating with said first end portion by a channel located on said axis and said second end portion having an opening therethrough.



a cap removably closing said second end portion;

injector means extending from outside the head into the central portion of the cavity, the injector means being supplied with said liquid products under pressure and having jet openings extending into the cavity and directed to project said products onto the concavely shaped second end portion; and

a discharge tube extending from the chamber to discharge the mixed products.

3,883,122

SCREW EXTRUDER

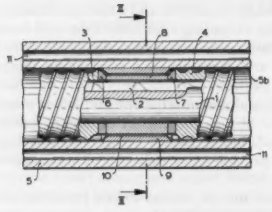
Hans Werner, Stuttgart-Nord, Germany, assignor to Werner & Pfleiderer, Stuttgart, Germany

Filed Feb. 15, 1974, Ser. No. 442,753

Claims priority, application Germany, Apr. 27, 1973, 2321325; Feb. 27, 1973, 7307358

Int. Cl. B29b *1/10;* **B01f** *7/08*

U.S. Cl. 259—192 **8 Claims**



1. A screw extruder for processing materials of pliable consistency, said screw extruder comprising in combination: an elongate casing including two parallel lengthwise bores of cylindrical configuration and intersecting each other;

a screw shaft mounting screw flights rotatably mounted in each bore, the screw flights on the shafts being in mesh and each shaft having intermediate its length a flight-free section, said sections being disposed in juxtaposition;

an inner bushing fitted upon each flight-free shaft section secured thereto against rotation and an outer bushing secured against rotation to the inside wall portion of the casing in radial registry with the respective inner bushing and coaxial therewith, the outer circumferential wall of each inner bushing and the inner circumferential wall portion of each outer bushing being correlated to define therebetween a shear gap of uniform radial width.

3,883,123

APPARATUS FOR THE REDUCTION OF IRON ORES BY DIRECT REDUCTION

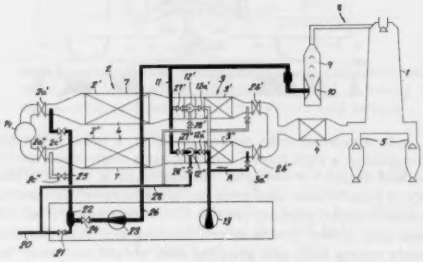
Heinz-Dieter Pantke, Essen-Frintrop, and Ulrich Pohl, Mulheim (Ruhr), both of Germany, assignors to Thyssen Niederrhein AG Hutten- und Walzwerke, Oberhausen, Germany

Filed Sept. 24, 1973, Ser. No. 400,058

Claims priority, application Germany, Sept. 23, 1972, 2246885

Int. Cl. F27d *13/00*

U.S. Cl. 266—29 **9 Claims**



1. An apparatus for the reduction of iron ore, comprising a reducing furnace; a pair of regeneratively heatable gas reformers; a pair of regenerative air preheaters each respectively connected at a downstream end of a respective one of said reformers; a regeneratively heat storing buffer heat exchanger disposed in common between said air preheaters and said furnace for heating gas cooler than the buffer heat exchanger and cooling gas hotter than the latter; means for feeding combustion air to said heaters alternately and sustaining combustion to produce combustion gases traversing the respective reformer; means for passing a mixture of hydrocarbon and an oxidizing medium through said reformer alternately and the respective heaters and conversion to reducing gas; and means for functionally interchanging said reformer between a heating mode and a reducing gas producing mode.

3,883,124

APPARATUS FOR DE-SLAGGING CASTING LADLES

Abel Galer, Grivegnee, Belgium, assignor to SA Louise NV, Grivegnee, Belgium

Filed Oct. 16, 1973, Ser. No. 406,940

Claims priority, application Germany, Oct. 16, 1972, 2250695

Int. Cl. C21c *7/00*

U.S. Cl. 266—37 **12 Claims**

1. A de-slagging apparatus comprising in combination:

a. a stand;

b. a column vertically disposed in and supported by said stand, said column having a longitudinal axis;

c. means for raising and lowering said column to selected heights in the direction of its longitudinal axis;

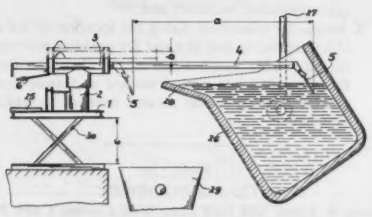
d. a horizontally extending guide supported on said column;

e. an arm arranged coextensively with said guide and being supported thereby, said arm having a length dimension and two ends;

f. a slag skimmer secured to one end of said arm;

g. means for moving said arm along its length dimension in and with respect to said guide;

h. a plurality of fixed upright bars forming part of said stand and defining a space therebetween for accommodating said vertical column;



i. a plurality of rollers mounted on a lower terminus of said column and each rollingly engaging a separate one of said upright bars; and

j. a plurality of rollers, mounted on an upper terminus of said upright bars and rollingly engaging said column.

3,883,125

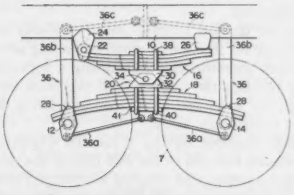
TANDEM SUSPENSION

Yukihiro Takatsu, Yokohama, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Mar. 13, 1974, Ser. No. 450,610

Int. Cl. B60g *11/08*

U.S. Cl. 267—38 **5 Claims**



1. A tandem suspension comprising:

two parallel axle housings (12, 14),

upper leaf spring means (16) mounted at both ends thereof on the chassis of a vehicle,

lower leaf spring means (18) mounted at the respective ends thereof to said axle housing (12, 14), and

a coupling mechanism (20) pivotally coupling said upper (16) and lower (18) leaf spring means together substantially at the middle portions of said upper and lower leaf spring means for relative pivotal movement between said upper and lower leaf spring means about an axis extending substantially parallel to said axle housings.

3,883,126

GAS SPRINGS

Lawrence George Nicholls, Birmingham, England, assignor to Girling Limited, Birmingham, England

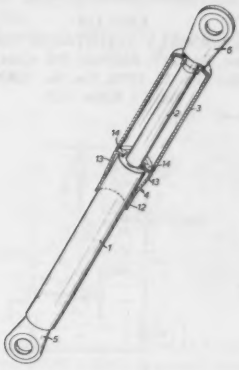
Filed Jan. 17, 1974, Ser. No. 434,283

Claims priority, application United Kingdom, Jan. 19, 1973, 2982/73

Int. Cl. F16f *5/00*

U.S. Cl. 267—65 R **7 Claims**

1. A gas spring comprising a cylinder body having one end closed, a piston rod reciprocable into and out of the cylinder body through the other end thereof between a retracted and an extended position of said spring, gas under pressure in said cylinder body operating at all times against the cross sectional area of said rod to urge it towards the extended position of said spring, and mechanical latching means operative in said extended position to prevent substantial relative movement between said piston rod and said cylinder body, said latching



means being manually releasable to permit such relative movement.

3,883,127

BUFFER HAVING A BUFFER BODY OF FOAMED SYNTHETIC MATERIAL

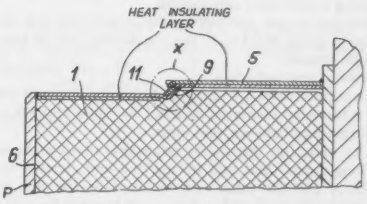
Wilhelm Schwarz, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Apr. 16, 1973, Ser. No. 351,504

Claims priority, application Germany, Apr. 22, 1972, 2219916

Int. Cl. F16f *1/37*

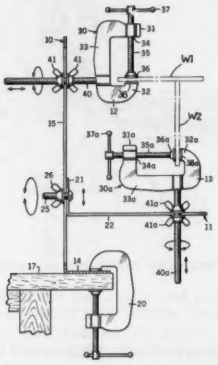
U.S. Cl. 267—140 **7 Claims**



1. A buffer which includes: a buffer body of foamed material having a first surface adapted to be acted upon by pressure, said buffer body being compressible in axial direction thereof by forces acting upon said first surface, mantle means of heat conductive material covering at least a portion of said buffer body and comprising a first section and a second section movable relative to each other in conformity with the compression and expansion of said buffer body which extends between both sections of the mantle means to substantially occupy space within one chamber, said first and second sections of said mantle means telescopically overlapping each other, end plate means respectively closing those ends of said telescopically interengaging mantle means which are remote from each other, said first and second sections overlapping each other with an anngular gap therebetween, ring means radially interposed between said first and second sections and bridging the angular gap, at least one of said sections being provided with bead-depression means having said ring means located and secured therein, one of said sections adjacent its pertaining bead-depression means being provided with deflecting surface means for deflecting the foamed material of the buffer body in a direction radially inwardly from the outer

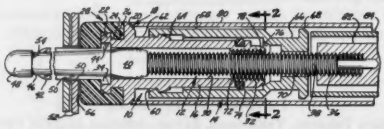
one of said sections when said sections are being telescoped into each other.

3,883,128
UNIVERSALLY ADJUSTABLE CLAMP
Ralph J. Breese, Box 217, Bourbon, Mo. 65441
Filed Feb. 25, 1974, Ser. No. 445,540
Int. Cl. B25b *1/22*
U.S. Cl. 269—45 **2 Claims**



1. An adjustable clamping device for attachment to a base, the device comprising:
   a. a first angle bracket including an attachment leg for attachment to the base and a substantially perpendicular outstanding leg having an elongate slot therein,
   b. a second angle bracket including an attachment leg for attachment to the outstanding leg of the first angle bracket and a substantially perpendicular outstanding leg having an elongate slot therein,
   c. fastener means connecting the attachment leg of the second angle bracket to the outstanding leg of the first angle bracket,
   d. a first clamp including:
      1. a substantially U-shaped body having opposed arms,
      2. a threaded clamping member having a clamping axis extending between said arms,
      3. an elongate, threadedly adjustable member having a longitudinal axis and having one end secured to the body and the other end received by the slot in the outstanding leg of the first angle bracket for selective translational and rotational movement of said adjustable member in said slot to move the first clamp for a relative coarse sliding adjustment toward and away from the outstanding leg of the second angle bracket and to rotate the clamping axis in a plane substantially perpendicular to the longitudinal axis of said adjustable member, and
      4. means for selectively fixing the location of the adjustable member in said slot and for enabling movement of the adjustable member and first clamp for a relative fine threaded adjustment toward and away from the outstanding leg of the first bracket to which it is attached, and
   e. a second clamp including,
      1. a substantially U-shaped body having opposed arms,
      2. a threaded clamping member having a clamping axis extending between said arms,
      3. an elongate threadedly adjustable member having a longitudinal axis and having one end secured to the body and the other end received by the slot in the outstanding leg of the second angle bracket for selective translational and rotational movement of said adjustable member in said slot to move the second clamp for a relative coarse sliding adjustment toward and away from the outstanding leg of the first angle bracket and to rotate the clamping axis in a plane substantially perpendicular to the longitudinal axis of said adjustable member, and
      4. means for selectively fixing the location of the adjustable member in said slot and for enabling movement of the adjustable member and second clamp for a relative fine threaded adjustment toward and away from the outstanding leg of the second bracket to which it is attached.

3,883,129
CLAMPING DEVICE
Sterling B. Jones, 858 Duff Ave., West Covina, Calif. 91790
Filed Oct. 5, 1972, Ser. No. 295,281
Int. Cl. F16b *13/04*
U.S. Cl. 269—49 **11 Claims**

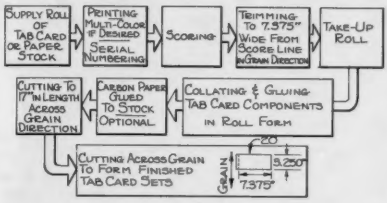


1. A clamping device for use in clamping work having an opening therethrough, comprising:
   an elongate main body having a head end and an aft end and formed with an axially extending passage therethrough;
   the head end having an end face adapted to engage the work to be clamped;
   an elongated tension member axially slidably mounted in the passage for free longitudinal extending and retracting movement therethrough and having a forward end projecting through the head end of the main body to pass through the work and an aft end projecting through the aft end of the main body;
   the tension member having a radially expansive gripper head spaced forward of the end face of the main body in extended position and adapted to enlarge radially from a contracted position, in which can pass through the work to an expanded size to engage the remote side of the work and clamp the work between the gripper head and the end face in response to retracting movement of the tension member;
   the head end of the main body having a formation for engagement by the pusher element of an applying tool and the aft end of the tension member having a formation for engagement by the puller element of the tool for producing the clamping action;
   an actuator carried by the main body and movable thereon to deflect at least a portion thereof transversely of the axis of the tension member into binding engagement with the tension member to lock it in clamping position, said actuator being in the form of a collar coaxially mounted on and axially slidable on the main body to a forward locking position and an aft releasing position;
   said collar being provided with an actuator portion arranged in camming relation with an aft portion of the main body to displace it laterally in response to forward movement of the collar and to release it for return to normal position in response to aft movement of the collar; and
   cooperating detent means formed on the collar and the main body to permit limited axial movement and prevent separation;
   the aft end of the collar extending beyond the aft end of the main body and being provided with a central axial guide aperture sized to freely slidably receive the aft portion of the tension member and normally maintain it on a coaxial path with the collar and out of binding engagement with the aft portion of the main body.

3,883,130
METHOD FOR FORMING TABULATING CARD SETS

Richard H. Hardesty, 138 Stratford Pl., Salisbury, N.C. 28144

Filed Oct. 12, 1972, Ser. No. 296,995
Int. Cl. B41f *13/64*
U.S. Cl. 270—18 3 Claims


SUPPLY ROLL OF TAB CARD OR PAPER STOCK
PRINTING MULTI-COLOR IF DESIRED SERIAL NUMBERING
SCORING
TRIMMING TO 7.375" WIDE FROM SCORE LINE IN GRAIN DIRECTION
TAKE-UP ROLL
CUTTING TO 17" IN LENGTH ACROSS GRAIN DIRECTION
CARBON PAPER GLUED TO STOCK OPTIONAL
COLLATING & GLUING TAB CARD COMPONENTS IN ROLL FORM
CUTTING ACROSS GRAIN TO FORM FINISHED TAB CARD SETS
GRAIN
5.250"
7.375"

1. A method for producing tabulating card sets with each set comprising a bottom card of relatively inflexible paperboard and a plurality of alternately arranged carbon sheets and paper sheets overlying the paperboard card and interconnected thereto along a removable end portion, and with each tabulating card set having a dimensional tolerance within a few thousandths of an inch in both the longitudinal and transverse directions such that the paperboard card may be used as an information storage device such as a tabulating machine punch card or the like, and comprising the steps of

advancing a continuous web of the paperboard and a plurality of continuous webs of paper from associated supply rolls and with the grain of each web extending in the longitudinal direction,

printing each of the advancing webs with a desired card indicia to define a series of card outlines and with each card outline being oriented to lie transversely across the web,

forming a score line by intermittently slitting each of the advancing webs, the score line extending along one side edge thereof to define a removable end portion along each card outline,

continuously slitting each of the advancing webs at a predetermined location along the other side edge of the advancing web while maintaining such predetermined location within a tolerance of a few thousandths of an inch in relation to the score line,

collating the continuous webs with intermediate continuous carbon sheets to form a continuous composite web and with the printed card outlines of each web being aligned with the card outlines of each adjacent web,

interconnecting the composite web along the side edge thereof which comprises the removable end portions,

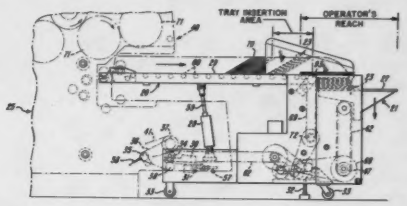
transversely cutting the composite web at regular spaced locations along the length thereof such that each cut length includes a plurality of printed card outlines, and then

transversely slitting the cut lengths of the composite web at a plurality of locations and along each transverse side edge of each card set to thereby form a plurality of individual card sets while maintaining a tolerance of a few thousandths of an inch between each transverse slitting line, whereby all four edges of the resulting card sets are formed by a slitting operation with the tolerance maintained within a few thousandths of an inch.

3,883,131
DELIVERY APPARATUS AND METHOD

Ohmer Anderson, Jr., and Robert Eugene Stephens, both of Dayton, Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Nov. 2, 1973, Ser. No. 412,192
Int. Cl. B65h *45/00*
U.S. Cl. 270—61 F 20 Claims



1. For stacking a continuous series of forms of predetermined length, improved delivery apparatus comprising:

a conveyor for transporting said forms along a horizontal path in an upstanding loosely assembled lengthwise progression,

a platform at the end of said conveyor,

means for raising and lowering said platform,

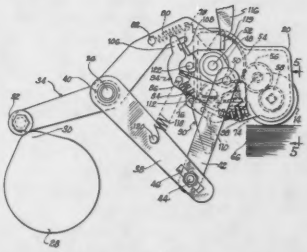
means for directing said forms from the horizontal path along said conveyor to a vertical path toward said platform, and

means including a pair of retractable ledges mounted above said platform, for segregating a group of forms at the end of said series from the other forms in said series by catching an outwardly extending dividing tray inserted in said forms and moving together therewith and thereby restraining the advance of said other forms onto said platform.

3,883,132
PAPER FEED CONTROL MECHANISMS

John L. Swanson, Libertyville, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed July 16, 1973, Ser. No. 379,549
Int. Cl. B65h *3/06*
U.S. Cl. 271—110 22 Claims



1. In a duplicating machine including a table for holding a stack of paper sheets, at least one feed member for engaging individual sheets to feed the sheets to the duplicating mechanisms, means for driving the feed member for achieving the feeding operation, and primary means for controlling the operation of the means for driving the feed member, the improvement comprising secondary control means for automatically controlling the feeding operation of the feed member depending upon the location of the top of said stack, said control means including a latch lever, means operatively con-

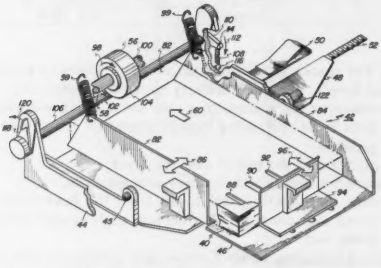
necting said latch lever to said feed member, said latch lever moving with said feed member as the feed member changes position in response to a change in the height of said stack, the movement of the latch lever resulting in engagement of the latch lever with the means for driving said feed member when the top of the stack reaches a predetermined position, the engagement of the latch lever with the means for driving the feed member stopping the driving of the feed member.

3,883,133

MOVABLE PACK ADVANCER

Robert P. Rebres, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 17, 1973, Ser. No. 398,024
Int. Cl. B65h *3/52, 1/12*
U.S. Cl. 271—122 **20 Claims**



1. A sheet feeding apparatus including:

means for separating and advancing successive sheets from a stack of sheets disposed in the sheet feeding apparatus; a supporting member laterally movable from an operating position to loading position remotely spaced from the operating position;

a base plate mounted pivotably on said supporting member, said base plate being adapted to support the stack of sheets;

biasing means for resiliently urging said base plate to pivot so as to move the stack of sheets disposed thereon into communication with said separating and advancing means;

a cam follower secured to said base plate; and

a cam member secured to the sheet feeding apparatus, said supporting member being laterally movable across said cam member with a portion of said cam follower in engagement therewith, said cam member having a profile such that as said cam follower moves therealong said biasing means pivots said base plate from a position wherein the uppermost sheet of the stack of sheets of support material is spaced from said separating and advancing means to a position in communication therewith; means for automatically locking said supporting member in the operating position; and

means for automatically actuating the sheet feeding apparatus in response to said supporting member being located in the operating position.

3,883,134

DETECTING AND REMOVING APPARATUS FOR SKEW FED SHEETS

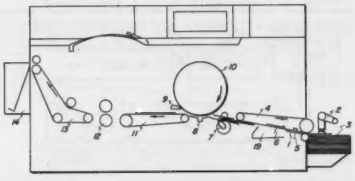
Michio Shinaki, Atsugi, Japan, assignor to Rank Xerox, Ltd., London, England

Filed Jan. 18, 1974, Ser. No. 435,137
Int. Cl. B65h *29/58*
U.S. Cl. 271—261 **1 Claim**

1. In an automatic sheet handling system including a moving belt for conveying sheets, apparatus for removing skew fed sheets from said belt comprising

a first microswitch and a second microswitch, said microswitches being positioned along a line perpendicular to the direction of movement of said belt such that the leading edge of a sheet traveling along said belt passing each of said microswitches causes the operation of said each of said microswitches, the contacts of said microswitches being connected to pass a signal during the time that only one, but not both, of said microswitches is operated,

first timing means connected to said microswitches and responsive to the time duration of said signal for providing an enabling signal when said time duration is greater than a predetermined amount,



second timing means,

a rotary solenoid,

relay means enabled responsive to said enabling signal for energizing said solenoid, said second timing means, and providing a self locking path for said relay means, and

a plurality of fingers operatively coupled to said solenoid and initially positioned adjacent said belt, said plurality of fingers responsive to the energization of said solenoid for pivoting and separating a passing sheet from said belt,

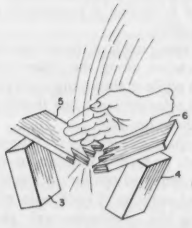
said second timing means including disabling means opening said self locking path of said relay means after a predetermined interval to disable said relay means, whereby said solenoid is de-energized and said plurality of fingers are returned to their intitial position.

3,883,135

SIMULATED KARATE DEVICE

Paul E. Milliken, 9061 Wall St., N.W., Massillon, Ohio 44646

Continuation-in-part of Ser. No. 359,099, May 10, 1973, abandoned. This application Aug. 23, 1973, Ser. No. 390,866
Int. Cl. A63j *5/00*
U.S. Cl. 272—8 N **9 Claims**



1. A simulated karate device comprising:

A. a separable element to be struck with a human hand;

B. said element comprising a pair of mating pieces, each piece having an irregular edge which interfits with a similar irregular edge on the opposite piece, each of the irregular edges comprising a series of outwardly extending projections alternately defining therebetween a series of inwardly extending depressions, the projections of one piece extending into the depressions in the opposite piece when the pieces are assembled together, in such manner that the projections of one piece overlap the projections of the other piece in the longitudinal direction;

C. each piece having a transverse recess in its respective irregular edge passing through the outwardly extending projections;

D. the recess in each edge being in alignment with the recess in the opposed edge of the mating piece when the two mating pieces are assembled together in edge to edge relationship; and

E. yieldable retaining means simultaneously extending through the transverse recesses in the outwardly extending projections on both pieces to key the two pieces together;

F. said retaining means having sufficient strength to releasably join together the mating pieces but being sufficiently yieldable to permit separation of the pieces when the separable element is struck with the hand to create the illusion of breaking a single continuous element.

3,883,136

AUTOMATIC SWING OPERATED BY ELECTRICITY

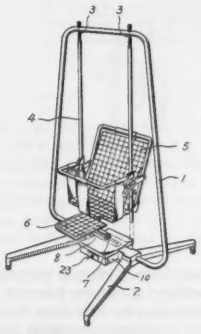
Young Ho Kim, 1164-2, Choryang-dong, Dong-ku, Busan, South Korea

Filed May 18, 1973, Ser. No. 361,541

Claims priority, application South Korea, July 10, 1972, 4381/72

Int. Cl. A63g *9/16*

U.S. Cl. 272—86 **1 Claim**



1. An automatic swing comprising:

a main frame;

a swing arm pivotally connected at its upper end to said main frame;

a first permanent magnet affixed to the bottom end of said swing arm;

an electro-magnet affixed to the bottom of said main frame immediately below the path of the permanent magnet; and

electrical circuit means isolated from said main frame and said swing arm for selectively energizing said electro-magnet and effecting an automatic oscillatory movement of aid swing arm by coaction between the magnetic field of said permanent magnet afffixed to said swing arm and the magnetic field of said electro-magnet, wherein said electrical circuit means includes:

a normally open switch;

a second permanent magnet affixed to said normally open switch and coacting with said first permanent magnet to close said switch only while said first permanent magnet is positioned proximate said electro-magnet,

electrical resistance means; and

switch means for selectively coupling said resistance means into and out of said circuit for varying the amplitude of oscillation of said swing arm.

3,883,137

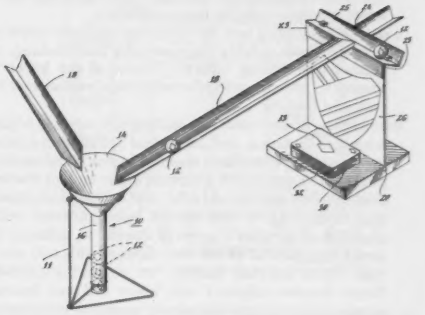
GAME APPARATUS

Paul J. Bengtson, 384 Main St., Danbury, Conn. 06810

Filed May 20, 1974, Ser. No. 471,800

Int. Cl. A63f *9/00*

U.S. Cl. 273—1 R **7 Claims**



7. A game apparatus comprising

a funnel-shaped receptacle made from transparent material adapted to support one end of each of a multiplicity of ramps with one end of each of said ramps positioned above the ingress means to said receptacle,

a multiplicity of stands having planar vertical members adapted for supporting the other ends of each of said ramps at levels higher than the level of said one end of each, with the plane of said each of said members normal to the long axes of the ramps with which it is associated, a multiplicity of ramps each of which is supportably positioned with one end on said receptacle and the other end on one of said members, and signalling means positioned on each of said stands on the side thereof which normally may face toward said receptacle.

3,883,138

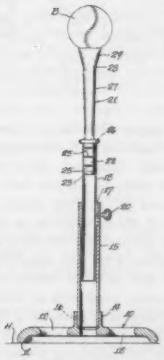
BATTING TEE APPARATUS

Andro J. Chorey, 8316 Gibson Rd., Canfield, Ohio 44406

Filed Aug. 6, 1973, Ser. No. 385,842

Int. Cl. A63b *69/40*

U.S. Cl. 273—26 R **2 Claims**



1. An improved batting tee comprising:

a base member adapted to rest upon a surface and free of attachment thereto, said base member having gently

rounded edges about its periphery to minimize injury to a person in the event of upset thereof, and having an upstanding tubular socket thereon,

a first upstanding tube having its lower end received in said socket and detachably secured therein,

a tubular bushing affixed within said tube adjacent the upper end thereof, said bushing providing an aperture of lesser internal diameter than said tube,

a second upstanding tube telescopingly received within said first tube and slidably engaged with said bushing, said second tube having enlarged means at the lower end thereof to prevent upward movement of said second tube past said bushing,

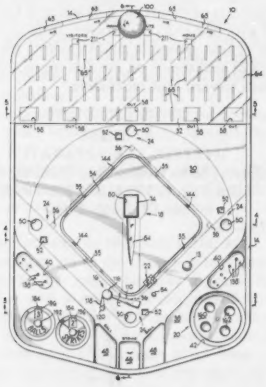
thumbscrew means releasably locking said tubes in adjusted telescoped position, and, an upright ball support comprising a solid rod of resilient material having a ball-receiving pocket at its upper end, a tapered lower end for frictional insertion into said second tube, said ball support adjacent said tapered lower end thereof being provided with a plurality of peripheral grooves therein to enhance frictional engagement of the ball support with said second tube when inserted therein, an outwardly extending flange thereon adjacent said lower end and having a diameter greater than that of said second tube for limiting the insertion of said ball support into said second tube.

3,883,139

BASEBALL TYPE GAME APPARATUS

Howard J. Morrison, Deerfield, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 28, 1973, Ser. No. 419,805
Int. Cl. A63f *7/06*
U.S. Cl. 273—89 **15 Claims**



1. In a baseball game including a simulated baseball, a playing surface on which the ball is rollingly supported having a simulated baseball diamond thereon, batting means mounted near home plate to hit the ball, pitching means to launch the ball toward the batting means, figures simulating baseball players which are mountable on the diamond, means to propel the figures around the diamond and safe/out means for determining whether a hit ball resulted in a hit or an out, the improvement in said safe/out means comprising:

indicating means associated with at least one of said bases including a ball engaging portion, a figure engaging portion which is adapted to engage said figure only when a ball engages said ball engaging portion, and a sign having indicia thereon indicating when a player is out, said sign being movable in response to said figure engaging said figure engaging portion between a normal safe position and an out position wherein said out indicia is displayed.

12. In a baseball game including a simulated baseball, a playing surface on which the ball is rollingly supported having a simulated baseball diamond thereon, batting means mounted near home plate to hit the ball, pitching means to launch the ball toward the batting means, figures simulating baseball players which are mountable on the diamond, means to propel the figures around the diamond and safe/out means for determining whether a hit ball resulted in a hit or an out, the improvement comprising:

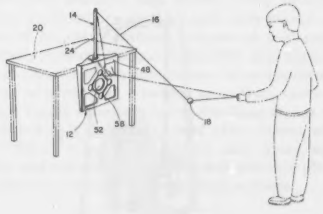
means dividing said playing surface into an accessible infield portion wherein a ball may be retrieved by a player and an inaccessible outfield portion wherein a ball cannot be retrieved by a player, and means associated with said inaccessible outfield portion for moving said ball onto said accessible infield portion after it has been in the inaccessible outfield portion, whereby said ball, after being hit, moves from said accessible infield portion to said inaccessible outfield portion and back to said accessible infield portion.

3,883,140

TARGET AND SLIDING PROJECTILE

Joseph T. Becker, 2 S. 214 Sheffield Dr., Glen Ellyn, Ill. 60137

Filed Feb. 1, 1974, Ser. No. 438,855
Int. Cl. A63b *71/00*
U.S. Cl. 273—101 **11 Claims**



11. A game as set forth in claim **8** wherein said target area comprises a frame forming member having a generally vertical face with an opening therein defining a mouth formation and said support means comprises a vertically disposed post to the upper end of which said flexible line is connected.

3,883,141

SIMULATED BOWLING GAME

Kenneth C. Sherwood, New York, N.Y., assignor to Kae-Tee Development Corporation, New York, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,321
Int. Cl. A63d *3/00, 13/00*
U.S. Cl. 273—121 A **9 Claims**

1. In a pin ball game apparatus simulating a bowling establishment for a ten pin game with the pins set in triangular array comprising:

a first panel surface having a forward end and a rear end having pictured thereon a set of pins in reverse position to that in which they are set up at one end of a bowling lane with the head pin in proximity to the forward end of the game apparatus and the **7** and **10** pins in proximity to the rear end of the game apparatus;

an indicating panel set up at an appropriate angle relative to the first panel to image the pin conditions of the first panel;

ball movement arresting means located in positions on the first panel corresponding to each pin position on the outside of the triangle;

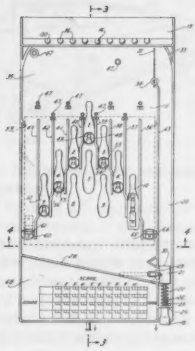
channel means located on said first panel for directing a ball to one of said ball movement arresting means;

means for projecting a ball and for causing the ball to move into one of said channels to the locus of the pin positions on the first panel;

a subpanel position beneath the first panel;

switch means below each ball movement arresting means;

means for interconnecting the switch so that when a switch is contacted by a projected ball a switch connection is changed, and depending upon the position of the connected switch, the closure of selected ones of the several switches which correspond to the pins, which could fall if a ball in a bowling lane under similar contact so that the interconnected switches represent, together with pin



positions directly behind switches, those pins which would have fallen with ball contact;

means for connecting the switch means associated with the ball arresting means for the head pin of the group in a circuit for activating substantially simultaneously all indicating means thereby to simulate a strike hit when the first delivered ball is that reaching the said contacting means; and

means for activating any previously inactive switch means in said ball arresting means for conditions when the second delivered ball is arrested at the location of the head pin thereby to indicate a spare.

3,883,142

BOARD GAME APPARATUS

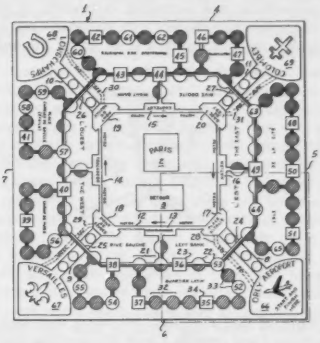
Robert H. Spohn, 7 Brookside Pl., Livingston, N.J. 07039

Filed July 9, 1973, Ser. No. 377,815

Int. Cl. A63f *3/04*

U.S. Cl. 273—134 AC **12 Claims**

1. In a board game apparatus, a board having a playing surface having on it marked spaces representing places and clusters of places which are to be visited by players during the playing of the game and bear titles and constitute stopping points, said playing surface also having lines that connect said spaces, said lines representing avenues of travel for connecting said spaces, certain lines representing avenues restricted to pedestrian travel, other lines encompassing both pedestrian travel and local transportation and still other lines representing avenues of rapid transit systems, a set of game pieces diversified in color or design representing players for registering movement along said lines, said lines constituting optional but continuous routes of play along which the speed of movement of said game pieces is governed by the density of stopping points marked in said lines, said avenues being differently colored or shaded and keyed to dice which are unlike in color corresponding to the colors or shading of said avenues for determining the permissible avenues along which a game piece may move and which also have indicia indicating the extent of movement of the game pieces, said lines connecting said clusters of spaces in such a manner as to permit travel between them to be interrupted by any player at points along



the second-mentioned avenue designated on the playing surface according to randomly indicated directions, there being a plurality of cards bearing indicia indicating such directions and said dice having indicia to direct the drawing of said cards.

3,883,143

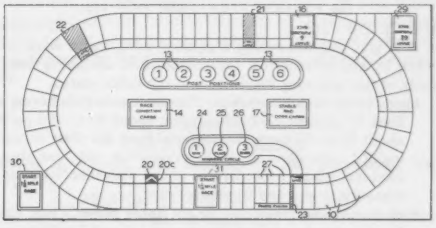
RACING BOARD GAME APPARATUS

Patricia Alexandra Kelley, 44 Stubbs Dr, Apt. 514, Willowdale, Ontario, and Alan Brian Kelley, 296 The Kingsway, Apt. 2, Islington, Ontario, both of Canada

Filed Feb. 13, 1974, Ser. No. 442,058

Int. Cl. A63f *3/00*

U.S. Cl. 273—134 CH **15 Claims**



1. A racing board game comprising a board having a series of spaces, a plurality of cards, a smaller plurality of holders movable over said spaces and each adapted to carry any one of said cards to move therewith, an insignium on each card, an insignium on at least one space matching the insignium on each card to indicate an advantage or disadvantage if the card is carried onto the space, and differing indicia on the movable holders indicative of different starting biases of the holders.

3,883,144

GOLF TEE

Malcolm Lazow, 333 Seventh Ave., Valley Stream, N.Y. 10001

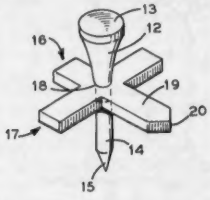
Filed Jan. 11, 1974, Ser. No. 432,644

Int. Cl. A63b *69/36, 57/00*

U.S. Cl. 273—183 A **1 Claim**

1. A golf tee comprising a shank portion, a cupped portion extending from one end of said shank portion for supporting a golf ball thereon, and an insertion portion extending from the other end of said shank portion and having a point on the end thereof for insertion into the ground; and means for limiting the extent of the insertion of said insertion portion into the ground to thereby locate said cupped portion at a determined level above the ground level and for insuring true vertical

placement of said shank portion, said limiting means comprising a pair of intersecting flat elongated members being coplanar and disposed at right angles to each other and the longitudinal axis of said shank portion, said elongated members being fixedly secured to and extending outwardly of said shank portion at the juncture thereof with said shank portion so that if the shank portion is inserted at an angle, the underside of



one or more of said elongated members may make contact with the ground and provide a lever to cause the shank portion to become vertically oriented to insure vertical placement of said shank portion and to maintain said tee in a true vertical position; said elongated members further providing visual means for (1) properly positioning the golf club head; and (2) properly locating the feet of the player with respect to optimizing his driving position.

3,883,145

GOLF BALL AND COMPOSITION FOR FORMING THE SAME

Alvon R. Cox, and William W. Latou, both of Ashland, Ohio, assignors to The Faultless Rubber Company, Ashland, Ohio

Continuation-in-part of Ser. No. 565,416, July 15, 1966, abandoned. This application Oct. 9, 1967, Ser. No. 673,931

Int. Cl. A63b *37/00*; **C08d** *3/08, 9/10*

U.S. Cl. 273—218 **22 Claims**

1. A golf ball comprising a unitary, solid, cured elastomer made by vulcanization of the composition consisting essentially of the following ingredients in the ratios stated:

highly resilient polybutadiene elastomer materials having at least 30 percent cis configuration about 80 to 100 parts.

about 25 to 50 parts of a material from the class consisting of 1,3 butylene glycol dimethacrylate, ethylene glycol dimethacrylate, polyethylene glycol dimethacrylate, and trimethylol propane trimethacrylate,

high density and molecular weight linear polyethylene having a molecular weight of between 1.5 and 2 million and a melt index of 0 in small particle size from about 2 to about 40 parts,

a peroxide curing agent about 0.5 to 10 parts, and

finely divided reenforcing and filler materials about 30 to 60 parts.

3,883,146

HAND-HELD PLAYBACK DEVICE, SYSTEM AND METHOD

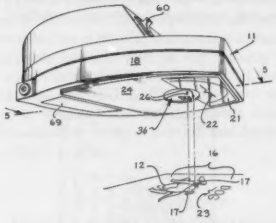
Reynold B. Johnson, Palo Alto, and Ronald D. Irvin, Los Gatos, both of Calif., assignors to Education Engineering Associates, Palo Alto, Calif.

Filed Apr. 4, 1973, Ser. No. 347,841

Int. Cl. G11b *25/04*

U.S. Cl. 274—9 C **9 Claims**

1. In a hand-held audio transducing device for transducing signals relative to a stationary record carried on a sheet of material, which sheet has observable information adjacent said record related to information playback in said record, a housing small enough to be held in one hand, a playback assembly within said housing including a rotatable body, means for rotating said body, a transducer carried by said body during rotation of said body for following a path of said record, means forming a substantially unobstructed observation portion through said housing allowing observation of said information contained in and to be reproduced from said record, means carried by said rotatable body, registration means and movable into and out of engagement with new sheet for registering said transducer to permit the transducer



to follow the record path, and means serving to retract said registration means clear of said sheet and to commence rotation of said body and transducer so as to transduce said information of said record for reproduction to the operator while indicating said information in said observation portion to be observed by the operator during reproduction of said information.

3,883,147

DRY LUBRICATED MATERIALS

Amedee Roy Troy, and James M. Geyman, both of Harper Woods, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 27, 1971, Ser. No. 212,413

Int. Cl. F16j *15/34*; **C10m** *7/06, 7/04*

U.S. Cl. 277—96 R **10 Claims**

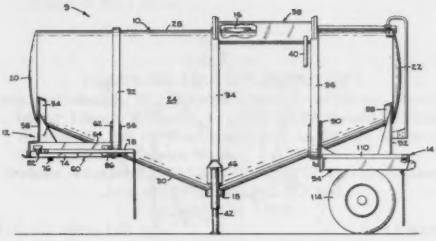
1. A member for use under dry lubricated conditions comprising: a substrate having a working surface thereon comprised initially of an iron oxide matrix containing an interspersed mixture of a trapping material means for embedding abraded particles and debris particularly iron oxide particles in the work surface during use selected from the group consisting of barium sulfate, cadmium sulfate, calcium oxide, calcium phosphate, calcium sulfate, manganese sulfate, sodium phosphate, sodium sulfate, sodium sulfide, sodium biphosphate, zinc sulfide, zinc oxide, titanium oxide, calcium fluoride, sodium borate, and mixtures thereof and a component selected from the group consisting of nickel coated graphite, graphite and mixtures thereof.

7. A regenerator section for a gas turbine engine comprising at least two members arranged for rubbing contact during operation of the engine, one of the members having an initial working surface comprised of an iron oxide matrix containing an interspersed mixture of nickel coated graphite or graphite and a particle-debris trapping material selected from the group consisting of barium sulphate, cadmium sulphate, calcium oxide, calcium phosphate, calcium sulphate, manganese sulphate, sodium phosphate, sodium sulfate, sodium sulfide, sodium biphosphate, zinc sulfide, zinc oxide, titanium oxide, calcium fluoride, sodium borate, and mixtures thereof, and wherein a transformation occurs in the work surface during a break-in period, forming as a result, a substantially continuous highly oriented film of Fe_2O_3 on the work surface of the one member and a film of Fe_2O_3 is also formed on the mating second member by transfer from the one member to the second member.

3,883,148
TRAILER TANK

Norman T. Miller, Modesto, Calif., assignor to Certified Stainless Services, Ceres, Calif.

Filed Feb. 11, 1974, Ser. No. 441,269
Int. Cl. B60p *3/22*
U.S. Cl. 280—5 C **7 Claims**



1. A trailer tank for transporting materials having fluid characteristics comprising:

a. an outer shell forming an enclosure for receiving such materials and being formed of side, bottom, top and end walls, said side walls having a radius of curvature in a transverse plane which is greater than the radius of curvature in a transverse plane of said bottom wall and wherein said bottom wall is approximately V-shaped in a longitudinal plane; and

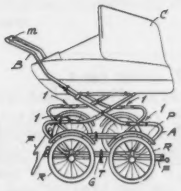
b. means forming a discharge opening at the lowermost point of said bottom wall,

the transverse cross-sectional-shape of said shell at approximately midpoint along the longitudinal axis thereof being approximately elliptical with the major axis thereof lying in a vertical plane and the eccentricity being such as to provide relatively steep sides for fast drainage.

3,883,149
BABY CARRIAGE FRAME

Gianluca Perego, Arcore, Italy, assignor to Perego-Pines S.p.A., Italy

Filed July 22, 1974, Ser. No. 490,259
Claims priority, application Italy, Mar. 7, 1974, 35639/74
Int. Cl. B62b *3/02*
U.S. Cl. 280—36 B **6 Claims**

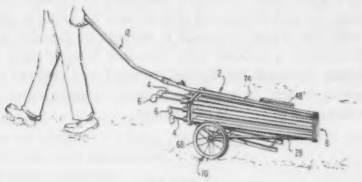


1. A collapsible baby carriage frame assembly, comprising an upper frame and including a crossbar structure comprising two spaced apart front crossbars extending obliquely upwardly of the longitudinal direction of the carriage and two spread apart rear crossbars extending adjacent said front crossbars and crossing the same at an angle symmetrical of said longitudinal direction, said front and rear crossbars extending to common upper and lower levels and being pivoted to each other at their cross-points and thereby adapted to be folded and to be unfolded and locked to serve as a support for a baby cabin and each crossbar having obliquely extending upper end portions and lower end portions extending in said longitudinal direction of the carriage; a handle bar having a handle portion and two spaced apart legs adapted to form extensions of said rear crossbars and having each a free end portion pivotally connected to the respective one of said upper end portions of said rear crossbars, the pivots defining an axis transverse to said longitudinal direction about which said handle bar is foldable toward said front crossbars; a spring element structure supporting said crossbar structure and comprising two spaced apart spring tube members of upwardly open bracket-like configuration and extending, in assembled state, in vertical alignment with the respective crossbars, each of said spring tube members having two free end portions projecting inwardly in said longitudinal direction and axially aligned with the respective lower end portions of said crossbars and a lower middle portion extending in the same direction; and means for yieldably connecting said lower end portions of said crossbars to said upper end portions of said spring tube members in a definite spaced relationship while permitting their mutual rotation about their longitudinal axes to enable said spring tube members to be folded toward said crossbar structure; a lower frame including two spaced apart connection members extending in said longitudinal direction and, in assembled state, adjacent said lower middle portions of said spring tube members; two spaced apart wheel axles extending between and secured to said connection members; and means for locking said lower frame in position on a supporting surface, each of said connection members comprising a front connection bar having an outer and an inner end and being secured to one of said wheel axles, and a rear connection bar having an outer and an inner end and being secured to the other wheel axle, said inner ends of said front and rear connection bars of each connection member being pivoted to each other in the space between said axles and said pivots defining an axis which is parallel to said axles and about which said rear connection bars along with the respective axle are pivotable relative to said front connection bars to fold said lower frame; wheel means mounted by twos on each of said lower middle portion of said spring tube members in spaced relationship corresponding to the spacement of said wheel axles; and means for mutually engaging and locking said wheel means to said lower frame in assembled state and unlocking and disengaging the same while collapsing said frame assembly.

3,883,150
GOLF CLUB CARRIER

Arthur A. Varela, 2207 Belle Haven Rd., Alexandria, Va. 22307

Filed Dec. 5, 1972, Ser. No. 312,280
Int. Cl. B62b *1/12*
U.S. Cl. 280—47.19 **15 Claims**



1. A carrier in which a set of golf clubs can be stored compactly when not in use and transported when in use with the heads of the clubs protruding from the carrier to permit selection and withdrawal of individual clubs for use, said carrier comprising body means for supporting the shafts of said golf clubs, said body means being elongated in the direction of the lengths of the golf club shafts and having longitudinal ends and longitudinal sides, a base on one longitudinal end of said body means upon which said carrier may be rested during storage to dispose said body means in a generally vertical orientation, a pair of wheels on said body means rotatable about a generally transverse axis remote from said base and close to the

center of gravity of the loaded carrier, the wheels of said pair extending beyond the longitudinal side of said body means which faces downwardly when said carrier is shifted to a generally horizontal orientation with said wheels being spaced laterally in opposite directions from the said center of gravity to stabilize the carrier against sidewise tipping when said body means is supported in a generally horizontal orientation by said wheels, and elongated handle means on the longitudinal side of said body means opposite said wheels, said handle means having along its length portions extending at angles with respect to each other so that said handle means protrudes longitudinally and upwardly from the end of said body means opposite said base when said body means is supported in a generally horizontal orientation by said wheels to dispose a free end portion of said handle means at a level for convenient manipulation by a person pulling the carrier along on said wheels with the said body means extending longitudinally close to the ground in a generally horizontal direction, the longitudinal protrusion of said handle from the last-mentioned end of said body means being sufficient to permit the person pulling the carrier to walk in front of the horizontally disposed carrier without contact with or interference from the carrier or the golf clubs therein.

3,883,151

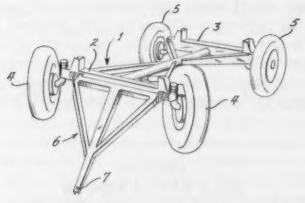
MEANS FOR GUIDING THE MOVEMENT OF A VEHICLE

Oscar W. Barchus, 1247 Mehlview Ct., St. Louis, Mo. 63125

Filed Sept. 13, 1972, Ser. No. 288,751

Int. Cl. B62d *7/00, 17/00*

U.S. Cl. 280—80 R **6 Claims**



1. In facilitating the directional movement of a vehicle through the arrangement of its front wheel assemblies to follow a guided course of travel comprising, a vehicle including a supporting frame for mounting of its wheel assemblies, each wheel assembly including a first axle pivotally mounting to said frame and maintaining an angular relationship with the frame to which it mounts to thereby achieve wheel camber, a second axle rotatably supporting a wheel and being mounted for limited forward and reverse pivotal movement to said first axle to thereby achieve wheel toe-in in the direction of vehicle movement.

3,883,152

WHEEL SUSPENSIONS

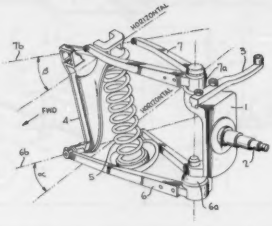
Christian Bourcier de Carbon, 64, Boulevard Maurice-Barres, 92-Neuilly-sur-Seine, France

Filed Feb. 12, 1971, Ser. No. 115,032

Int. Cl. B62d *7/06*

U.S. Cl. 280—96.2 R **11 Claims**

1. A suspension device for automotive vehicle wheels, comprising a wheel mounting, including the wheel spindle, having upper and lower supporting connections with the chassis of the vehicle, said lower connection comprising a member extending transversely outwardly with respect to the chassis, means connecting an inward portion of said connection with said chassis for approximately up and down movement flexing with relation to the chassis, the axis of said flexing movement inclined downwardly and rearwardly with respect to the direction of movement of the vehicle; said upper connection comprising means for hingedly connecting the upper portion of the wheel mounting to the chassis sufficiently rearwardly of the wheel spindle and of the lower connection that, together with



the inclination of the lower connection, the path of oscillatory movement of the spindle is inclined rearwardly with regard to the direction of movement of the vehicle, the angle of inclination being a minimum of from about 10° to about 30°; said device including spring means for resilient suspension of the vehicle from the wheels.

3,883,153

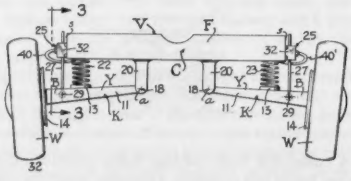
APPARATUS FOR SUPPRESSING SPRING ACTION BETWEEN THE WHEEL MOUNTS AND FRAME OF A VEHICLE

Bhupindar Singh, 18678 Cumnoch Pl., Northridge, Calif. 91324, and Donald A. Swauger, 20616 Blackhawk St., Chatsworth, Calif. 91311

Filed June 25, 1973, Ser. No. 372,962

Int. Cl. B60g *13/02*

U.S. Cl. 280—124 R **10 Claims**



1. In combination with a spring mount for a wheel which is normally articulatable relative to the frame of a vehicle and an hydraulic braking system of such vehicle, a spring suppressor comprising:

1. a housing secured to the frame of such vehicle and having a passage formed therethrough;
2. a strut member having one end pivotally connected to such spring mount and its opposite end arranged for free sliding movement through the passage through said housing during normal articulation of the spring mount;

3. an hydraulically operated caliper type brake in said housing including a pair of brake shoes embracing said strut therein; and
4. an hydraulic brake operating system in said vehicle communicating with said hydraulically operated caliper type brake for urging the brake shoes thereof into gripping engagement with said strut to thereby render the spring mounts of the vehicle in fixed relation relative to the frame of the vehicle.

3,883,154

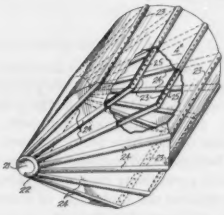
CRASH PROTECTION EQUIPMENT

Foy McCullough, Jr., Bellevue; Duane A. Williams, Mercer Island; Lincoln B. Katter, Lynnwood, and Donald R. Poole, Woodinville, all of Wash., assignors to Rocket Research Corporation, Redmond, Wash.

Division of Ser. No. 23,735, March 30, 1970. This application June 16, 1971, Ser. No. 153,744

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **3 Claims**



1. Safety apparatus for a vehicle having a passenger compartment comprising an inflatable cushion located within the vehicle movable between a collapsed, inoperative position and an inflated, operative position for restraining an occupant of the vehicle during a collision; a flexible, inflatable, tubular framework operatively associated with said cushion and operable upon inflation to move said cushion to said operative position and causing inflation of said cushion by aspiration of air into said cushion during such movement, said framework including at least one opening into the interior of said cushion to provide inflating fluid supplemental to the air pumped into said cushion by aspiration during movement of said cushion to said operative position; a source of inflating fluid operatively associated with said framework for inflating said framework; and a collision sensor mounted on said vehicle for initiating fluid flow from said source to said framework upon the sensing of a vehicle collision.

3,883,155

PROTECTIVE PADDING ESPECIALLY FOR THE BACKREST AND HEADREST IN A MOTOR VEHICLE

Hermann Renner, Magstadt, and Gerhard Busch, Gechingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

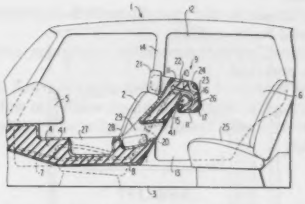
Filed June 26, 1972, Ser. No. 265,988

Claims priority, application Germany, June 26, 1971, 02131970

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 B **35 Claims**

1. A protective padding arrangement for vehicles having an interior space with an instrument panel and adjustable seats disposed in a front portion thereof and rear seat means disposed in a rear portion thereof, the arrangement comprising: padding means disposed in the interior space rearwardly of the adjustable seats and extending substantially over the entire width of the interior space, said padding means being mounted independently of the adjustable seats in the interior space to maintain the distance between the padding means and the rear seat means constant regardless of the adjustment of the adjustable seats, said padding means including a substantially U-shaped means extending between the adjustable seats toward the front of the interior space for connection with the instrument panel substantially in the central area thereof, an outer



zone of elastic material having high damping properties, a closed outer covering, and an inner zone which plastically deforms with energy absorption upon exceeding a predetermined load.

3,883,156

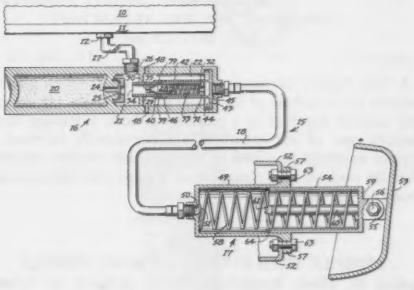
BUMPER-ACTUATED TRIGGER MECHANISM FOR VEHICLE SAFETY CRASH BAG

Wallace N. Frazier, 111 Richland Ave., Smyrna, Tenn. 37167

Filed Feb. 1, 1974, Ser. No. 438,940

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **2 Claims**



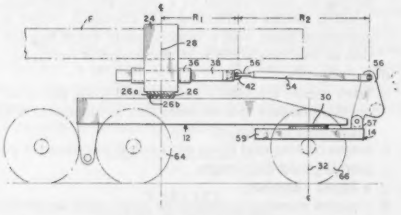
1. A device for inflating a vehicle safety crash bag comprising:
a. a vehicle frame,
b. a container on said frame containing compressed gas and having an outlet closed by a rupturable diaphragm,
c. conduit means connecting said container outlet in fluid communication with a vehicle safety crash bag for inflation of said bag when said diaphragm is ruptured,
d. a firing pin,
e. latch means releasably holding said firing pin in an inoperative position spaced from and in alignment with said rupturable diaphragm,
f. means biasing said firing pin toward its operative position piercing said diaphragm,
g. a liquid chamber,
h. a piston member reciprocable within said liquid chamber between an inoperative position and an operative position,
i. operative means connecting said piston member and said latch means for releasing said firing pin to its operative position when said piston member is in its operative position,
j. a gas cylinder fixed upon said vehicle frame,
k. a contractible wall member reciprocably movable axially within said gas cylinder for compressing gas within said cylinder,
l. a vehicle bumper connected to said contractible wall member for movement therewith,

m. spring means in said gas cylinder normally biasing said wall member to an expanded inoperative position,
n. a liquid conduit, filled with liquid, in open fluid communication with said liquid chamber and connected to said gas cylinder,
o. an outlet port in said gas cylinder in fluid communication with said liquid conduit,
p. a second pressure-rupturable diaphragm closing said outlet port, and
q. means associated with said contractible wall means for rupturing said second diaphragm when said wall member is moved axially toward said cylinder a predetermined distance.

3,883,157
BICYCLE CONVERSION DEVICE
Kenneth Wayne Simpkins, 3024 N. 24th St., Phoenix, Ariz. 85016
Filed Sept. 24, 1973, Ser. No. 400,392
Int. Cl. B62k *15/00*
U.S. Cl. 280—287 **3 Claims**

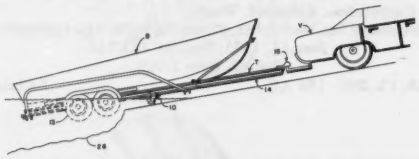
3. The bicycle conversion device as set forth in claim **2** wherein the members of the blade guiding device are detachably secured together by a plurality of bolts extending freely through one of the members and threadedly received in aligned openings provided in the opposite member whereby after the members are placed about a tubing the bolt serves to clamp the device firmly to the tubing.

3,883,158
VEHICLE WITH STEERABLE REAR WHEELS
Tyman H. Fikse, Enumclaw, Wash., assignor to Pointer-Willamette Trailer Co., Inc., Renton, Wash.
Filed July 29, 1974, Ser. No. 492,484
Int. Cl. B62d *53/00*
U.S. Cl. 280—404 **4 Claims**



1. An elongated vehicle comprising:
A tractor having a main frame, at least two forward steerable wheels on said main frame, rearward carriage means having forward and rearward ends and wheels supporting the carriage on the ground, first bearing means for supporting said main frame on said carriage means for movement about a first vertical axis, a trailing frame rearward of said first bearing means, second bearing means for supporting said carriage means rearward end on said trailing frame for movement about a second vertical axis, at least two steerable wheels on said trailing frame, lengthwise adjustable actuating means coupled between said main frame and said trailing frame steerable wheels for steering said trailing frame wheels in response to horizontal rotational movement of said main frame relative to said carriage means about said first vertical axis whereby the trailing frame steerable wheels will steer said trailing frame to allow turning of the vehicle about smaller radii.

3,883,159
AUXILIARY ROLLER WHEEL DEVICE FOR IMMERSIBLE BOAT TRAILERS
William P. Whitley, Jr., 4525 E. 10th Ln., Hialeah, Fla. 33013
Filed Feb. 16, 1973, Ser. No. 333,208
Int. Cl. B60p *3/10*
U.S. Cl. 280—414 R **2 Claims**



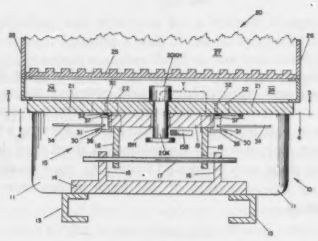
1. An auxiliary roller wheel device for boat trailers and the like comprising, in combination, a body member, said body member comprising a substantially rectangular base plate, a pair of spaced, parallel trunnion members extending outwardly of one side of said base plate, a wheel, means journalling said wheel between said trunnion members, the other side of said base plate comprising means for removably securing said base plate against the underside of a trailer framework I-beam member, said base plate securing means comprising an upstanding wall portion extending outwardly of the other side of said base plate and along one edge thereof, said upstanding wall portion merging, at its outer end, with a top plate portion in spaced, parallel relation with respect to said base plate and defining therewith an open-ended slot, means for clamping said body member to a trailer framework I-beam member web portion received in said slot, said top plate portion being in the form of an equilateral triangle the apex of which extends outwardly of said short, upstanding wall portion for a distance of somewhat less than one-half the transverse width of said base plate, said clamping means comprising a screw member threadingly received in a threaded opening through said apex portion of said top plate portion, said body member being integrally formed with said base plate, said trunnion members, said upstaning wall portion and said top plate portion, said trunnion members each being integrally formed along their outsides with central, vertically-extending reinforcing rib portions merging at their upper ends into opposed portions of said one side of said base plate.

3,883,160
TRAILER ANTI-JACKKNIFING DEVICE
William G. Meyers, R.R. 1, Gretna, Nebr. 68028, and Arthur A. Dirks, 5357 N. 47th St., Omaha, Nebr. 68104
Filed Mar. 21, 1974, Ser. No. 453,364
Int. Cl. B62d *53/08*
U.S. Cl. 280—432 **6 Claims**

1. Trailer anti-jackknifing device in combination with a conventional tractor-drawn trailer wherein the tractor includes a forwardly disposed operator's cab and rearwardly disposed fifth wheel assembly unit having a skid-plate that includes a generally circular forward major portion and a bifurcate rearward minor portion and including therewithin a kingpin extending along the tractor-trailer vertical pivot-axis, the trailer underside including a frontal base-plate having a depending kingpin overlying the fifth wheel unit skid-plate bifurcate portion, and the trailer extending longitudinally rearwardly from and in pivotably associated relationship with the tractor through said kingpin vertical pivot-axis, said anti-jackknifing device comprising:

A. At least one vertically reciprocatable upright locking-pin as the reciprocatably movable plunger of a fluid-actuatable piston of the casing-plunger type, the stationary casing portion of the piston nestably supported within the recess lower horizontal shelf of a generally C-shaped support member and the plunger locking-pin portion of the piston being surrounded by the upper horizontal shelf of said C-shaped support member, the locking-pin being ultimately attached to the fifth wheel skid-plate by removably abuttably attaching the C-shaped support upright intermediate concave portion to the skid-plate generally circular forward peripheral portion, said plunger locking-pin having a lower normal-station located wholly downwardly below the trailer base-plate and an upward extended-station;

B. Actuation means for causing the plunger locking-pin to vertically reciprocate between said lower normal-station and said upward extended-station, said locking-pin actuation means including a control means located within the



operator's cab and hence remote from the tractor fifth wheel unit skid-plate; and

C. Sectorially extending confinement means for the locking-pin and effective at extended-station only thereby preventing trailer jackknifing about the tractor-trailer vertical-axis during panic situations but not interfering with sharp tractor turns during normal driving, said horizontal sectorial confinement means having a continuous sectorial extent within the range of 15°–25° and being attached to the trailer frontal base-plate and located radially outwardly from the tractor-trailer vertical pivot-axis and in common elevation with the locking-pin upward extended-station, the confinement means central portion being in registry with the locking-pin when the pivotal trailer is in rearwardly longitudinally extending relationship with the tractor fifth wheel unit and the kingpin pivot-axis thereat and wherein the trailer base-plate in addition to the sectorial confinement means and spaced from the respective terminii thereof includes at least two safety-holes spaced a constant-radius from the kingpin pivot-axis.

3,883,161

COMBINED BOOKLET AND SCORE CARD WITH TEAR-OUT SCORE GRID

William M. McGee, 8030 El Paso St., La Mesa, Calif. 92041, and Jesse H. Melder, 8638 Hebrides Dr., San Diego, Calif. 92126

Filed May 29, 1973, Ser. No. 364,929
Int. Cl. G09b *19/22*
U.S. Cl. 283—50 **3 Claims**

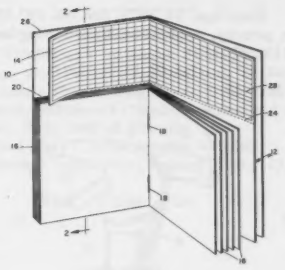
1. A combined booklet and scorecard comprising:

a single sheet score card having a score grid portion:

a book attached to said score card so that the score card is in flyleaf position, said book having printed pages selectively and concomitantly visible with the whole of said score grid portion;

said pages having aligned edges mutually reinforcing each other and in use defining a firm tearing edge against which said score grid portion is pressed while being torn from the remaining portion of said card;

said card being weakened along a line positionally coinciding closely with said tearing edge; and



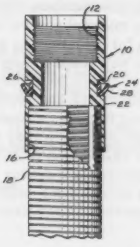
said book having a cover disposed exteriorly of said book and card and being a supportive backing for said score grid to facilitate a user's writing thereon.

3,883,162

WELL SCREEN FITTING AND METHOD OF SEALING SAME TO A CASING

Edward N. Colburn, Minneapolis, Minn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 18, 1974, Ser. No. 452,483
Int. Cl. F16l *17/00*
U.S. Cl. 285—111 **1 Claim**

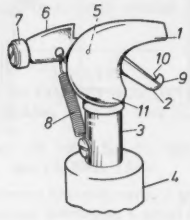


1. In combination, a well casing and a well screen fitting for sealing a well screen to the interior surface of said well casing through which it is moved to its final position, said well screen fitting comprising an elongated cylindrical body member having a recess in one end for receiving a well screen, a circumferential groove in the wall of the body at a position spaced axially from said recess, a generally V-shaped flexible sealing ring having a base portion and inner and outer wall portions extending upwardly from said base portion, said sealing ring being positioned along its entire axial extent in said groove with said base portion located at the end of the groove closest to the recess, the inner wall portion of the ring having its inner surface in tight engagement with the inner wall of the groove throughout the length thereof and the outer wall portion of the ring being formed so as to extend outwardly in a skirt-like fashion relative to the outer surface of the fitting, the combined wall thickness of said inner and outer wall portions being between 70-80% of the radial distance between the inner wall of the circumferential groove and the inner wall of the well casing, the outer wall portion of the ring being of sufficient resiliency and axial extent that it will fold over on itself and be compressed when the fitting and sealing ring are moved a short distance in said well casing in the direction opposite to that used for installing the fitting into the casing.

3,883,163
MACHINES FOR STITCHING CUSHIONS, MATTRESSES AND THE LIKE

Nils Olof Nestenius, Muskotgan 21, 252 55 Helsingborg, Sweden

Filed Sept. 14, 1973, Ser. No. 397,594
Claims priority, application United Kingdom, Sept. 25, 1972, 44233/72
Int. Cl. B65h *69/04*
U.S. Cl. 289—18 **3 Claims**



1. A machine for stitching padded articles, comprising a presser foot for compressing a padded article in the region of where it is to be stitched, needle means for passing a length of tying material through the padded article at spaced points to form a loop of tying material extending through the padded article, means for holding the ends of the loop of tying material, and means for tying a knot in the ends of the loop of tying material, the knot tying means comprising a pair of co-operating jaw members, means for advancing and retracting the jaw members whereby the jaw members can be advanced into engagement with the ends of the loop of tying material, means for rotating the jaw members whereby a closed loop of the ends of the tying material can be formed about the jaw members, and means for actuating the jaw members whereby the jaw members can be caused to grip the ends of the tying material adjacent said closed loop, the jaw members being retractable by said advancing and retracting means to withdraw the jaw members from the closed loop and to pull the ends of the tying material whereby they are gripped by the jaw members through the closed loop to form and tighten a knot, said jaw members comprising a cutting edge formed thereon for cutting the ends of the tying material where these are gripped in the jaw members when a knot has been formed and tightened.

3,883,164
DOOR LOCK WITH SAFETY RELEASE

Gerald W. Galbreath; Alfred T. Dietrich, and George E. Mosbarger, all of Marion, Ohio, assignors to Overhead Door Corporation, Dallas, Tex.

Filed Apr. 2, 1974, Ser. No. 457,167
Int. Cl. E05c *15/02*
U.S. Cl. 292—92 **10 Claims**

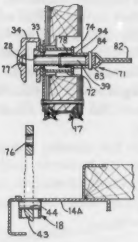
1. A door lock structure for an upwardly acting door of a truck van, comprising:

latch means mounted on said door adjacent one side thereof, said latch means including mounting plate means disposed adjacent said one side of said door and fixedly mounted relative to said door, and an actuating member pivotally mounted on said mounting plate means;

said latch means further including a latch bolt pivotally supported on said mounting plate means;

catch means adapted to be mounted on the bed of a truck and positioned for engagement with said latch bolt when the lower edge of said door is adjacent with said bed and said catch means;

releasable coupling means movably carried by said door for normally connecting said latch bolt to said mounting plate means while permitting pivotal movement of said latch bolt relative to said mounting plate means, said coupling means when disengaged causing said latch bolt to be totally disconnected from the remainder of said latch means, the remainder of said latch means remaining connected to said door; and

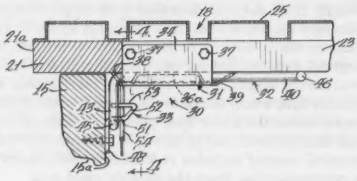


release means accessible only from the other side of said door and connectible to said coupling means for selectively disengaging said coupling means to disconnect said latch bolt from said mounting plate means, whereby said latch bolt is totally disconnected from said door so that said door may be moved toward an open position without prior disconnection of said latch means from said catch means.

3,883,165
DOOR STOP FOR A LATERALLY MOVABLE DOOR

Ludwig Wenzlow, Deerfield, Ill., assignor to Chromalloy American Corporation, Harvard, Ill.

Filed Mar. 29, 1974, Ser. No. 455,999
Int. Cl. E05c *1/04*
U.S. Cl. 292—302 **12 Claims**



1. A door stop for a laterally movable door which has a forward edge and a rearward edge and which is hung on a building wall to selectively cover a door opening that has a first jamb and a second jamb, said door stop comprising, in combination:

a bracket providing a horizontal slideway mounted adjacent the forward edge of the door on the door surface which is toward the wall;

a slide member in said slideway and projecting from both ends of the bracket, said slide member having a front end and a rear end;

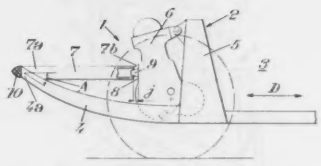
an integral offset stop bar at the front end of the slide member which engages the first jamb as the door nears fully closed position, and which is thereafter abutted by the bracket to stop forward movement of the door, said stop bar engaging the second jamb when the door is in fully open position;

and ears at the rear end of the slide member which are abutted by the bracket when the door is fully open.

3,883,166
END STRUCTURES FOR VEHICLES

Jean Cadiou, Paris, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Nov. 20, 1973, Ser. No. 417,575
Claims priority, application France, Nov. 28, 1972, 42251
Int. Cl. B60r *19/02*
U.S. Cl. 293—63 **10 Claims**

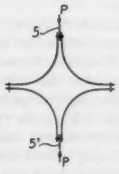


1. A longitudinal end structure for a vehicle, comprising:
a transverse unit forming a wall of the body of said vehicle;
a first longitudinal member fixed at one end to said transverse wall unit, the other end of said first longitudinal member extending from said transverse wall unit to an end of said vehicle;
a second longitudinal member extending from said transverse wall unit to said other end of said first member, said first and second members forming an angle with each other;
wherein one of said first and second members is inclined with respect to the longitudinal axis of said vehicle; and wherein one end portion of said second member is fixed to said other end portion of said first member and the other end portion of said second member is free and spaced from said transverse wall unit; and
means for guiding said free end portion of said second member into engagement with a stop zone of said transverse wall unit only upon application of a force sufficient to deform at least one of said first and second members.

3,883,167
DEVICES FOR ABSORBING ENERGY BY PLASTIC DEFORMATION

Bernard Tanet, and Bernard Elias, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt (Hautes de Seine) and Automobiles Peugeot, Paris, both of, France

Filed Apr. 5, 1973, Ser. No. 348,094
Claims priority, application France, Apr. 13, 1972, 72.13022
Int. Cl. B60r *19/02*; **G01p** *15/06*
U.S. Cl. 293—70 **6 Claims**

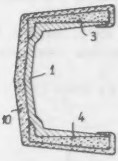


1. An energy-absorbing device comprising two sets of plastically-deformable tongues, each tongue of a set diverging from each other tongue thereof, said sets being rigidly fixed to each other and two anchorages at the ends of the tongues adapted to be brought closer together under the action of a load, the interior surface of each tongue of each set adjacent its respective anchorage facing the interior surfaces of the other tongues of its respective set, in which the deformable tongues of said device are incurved and are coupled to each other, at least in pairs, and in which said anchorages are separated by said two sets of tongues, and are located at the junction of at least two tongues of the same set.

3,883,168
COMPOSITE VEHICLE BUMPER

Marcel Goupy, and Pierre Roubinet, both of Billancourt (Hauts de Seine), France, assignors to Regie Nationale des Usines Renault, Billancourt (Hauts de Seine) and Automobiles Peugeot, Paris, both of, France

Filed Mar. 7, 1974, Ser. No. 449,103
Claims priority, application France, Mar. 13, 1973, 73.08881
Int. Cl. B60r *19/04*
U.S. Cl. 293—98 **5 Claims**

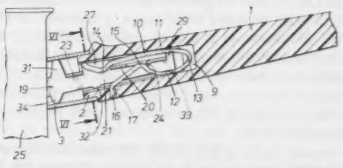


1. Composite bumper for motor vehicles, which comprises a shaped element having a plurality of apertures formed therein, this element consisting of a multidirectional stratified structure of fibers and resin, and at least one reinforcing element consisting of a unidirectional stratified structure of resin-impregnated fibers extending outside said apertures.

3,883,169
HANDLE FOR POTS, PANS, AND THE LIKE

Wolfgang Fischbach, Daaden, Germany, assignor to Heinrich Baumgarten, Eisen- und Blechwarenfabrik, Siegen, Germany

Filed Dec. 26, 1973, Ser. No. 428,234
Claims priority, application Germany, Dec. 30, 1972, 2264244
Int. Cl. A47j *45/10*
U.S. Cl. 294—31 R **6 Claims**



1. A handle for an object, comprising:
a supporting arm secured to said object and extending outwardly therefrom, said supporting arm having abutment means and projection means thereon;
a handle body having a cavity thereon adapted to receive said supporting arm therein;
a generally U-shaped spring located in said cavity and being adapted to clip and fasten said handle body without play to said supporting arm, said spring consisting of a pair of flexible limbs which normally engage the interior surface of said cavity, said limbs having spring humps offset in relation to one another along the longitudinal length of said spring; and
stop means on said handle body for engaging a free end of one of said limbs to prevent said spring from a longitudi-

nal displacement relative to said handle body, said supporting arm being received in said cavity and between said limbs to effect a flexing of said limbs outwardly away from each other by engagement of said spring humps with said abutment means, said projection means engaging said interior surface of said cavity for supporting said handle and limiting the relative turning movement between said handle body and said supporting arm, the portion of said spring humps engaging said abutment means of said supporting arm effecting the application of an axial force to said handle body to urge said handle body toward said object.

3,883,170

HOISTING SHACKLE WITH QUICK RELEASE ATTACHMENT MEANS

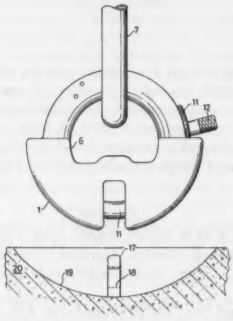
Siegfried Fricker, Wiernsheim, and Horst Reinkensmeier, Neifern-Oschelbronn, both of Germany, assignors to Siegfried Fricker, Wiernsheim, Germany

Filed July 10, 1973, Ser. No. 378,029

Claims priority, application Germany, Aug. 16, 1972, 22401714

Int. Cl. B66c *1/36*

U.S. Cl. 294—83 R **15 Claims**



1. A hoisting shackle system with a quick release attachment device for attaching a hoisting harness to a load at one or more attachment points, comprising in combination:

a ring-shaped closed shackle body having an annular cavity giving it a shape similar to that of an upright hollow torus and being thus adapted to form an articulated, chain-link-type end member of a hoisting harness or the like of which a hook or end loop can reach through the central aperture of the torus, the shackle body having an upper arcuate portion in which the outer peripheral wall of the hollow torus structure is removed so as to leave a radially open, U-shaped cross-sectional wall profile around its annular cavity;

an arcuate locking bolt received in the annular cavity of the shackle body so as to be guided therein for movement along the curvature of said annular cavity;

a transverse radial slot in the lowermost portion of the shackle body which reaches upwardly a distance beyond the cross-sectional space occupied by the locking bolt inside the annular cavity;

an anchoring element capable of being fixedly attached to a load and having an upstanding eye portion with a transverse opening, the eye portion fitting into the radial slot of the shackle body in such a way that the locking bolt can be inserted through its opening, thereby attaching the anchoring element to the shackle body; and

means for releasing the anchoring element from the shackle body, by retracting the locking bolt from its locked position in which it traverses said radial slot to a position outside the slot region.

3,883,171

CRUSH RESISTANT COMPARTMENT FOR VEHICLES

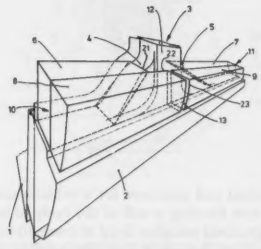
Andreas Bauer, Fallersleben, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed July 20, 1973, Ser. No. 381,082

Claims priority, application Germany, July 31, 1972, 2237532

Int. Cl. B62d *25/00*

U.S. Cl. 296—28 R **10 Claims**



1. A crush resistant compartment for a vehicle having an access opening flanked by a pair of fixed support columns extending between upper and lower walls of the compartment, and a movable closure member for opening and closing the opening, said compartment comprising:

a reinforcing impact resistant beam forming part of the closure member and extending transversely across the opening substantially between and adjacent each of the fixed columns when the opening is closed, said beam having a projecting outer portion adjacent its outer surface, said projecting outer portion defining an inwardly facing bearing surface overlapping one of said columns for abutting the column upon lateral impacting of the beam inwardly,

said beam having a second bearing surface located between said projecting outer portion and an inner surface thereof and facing said one column within said opening when the opening is closed by said closure,

the first bearing surface and the second bearing surface defining therebetween a recess receiving said one column.

3,883,172

VEHICULAR SEAT MOUNTING LINKAGE

James C. Barton, Peoria; James P. Mueller, East Peoria, both of Ill., and John W. Carter, Davenport, Iowa, assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed July 2, 1973, Ser. No. 375,483

Int. Cl. A47c *3/22*

U.S. Cl. 296—65 **13 Claims**

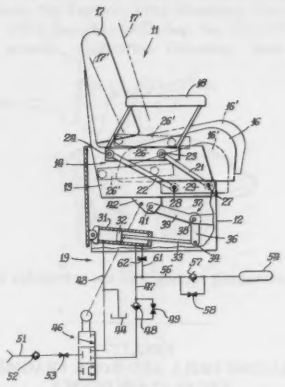
1. An operator seat assembly in a vehicle having a longitudinal axis and an operator station, the seat assembly being disposed in the operator station and comprising

a base structure secured to the vehicle,

a seat frame for supporting an operator,

forward and rearward link means respectively pivoted between said base structure and said seat frame, said rearward link means being effectively longer than said forward link means, said forward and rearward links forming in combination with said seat frame and said base structure to which they are pivotably affixed an unsymmetric quadrilateral having sides of fixed length, said forward and rearward link means being disposed with their respective linear axes tending to remain in substantial convergence adjacent a relatively remote point located below and in longitudinally spaced apart relation forward of the seat assembly, said point of convergence being preselected with reference to the vehicle, and

a resilient means effectively interconnected between said seat frame and said base structure for yieldingly resisting



movement of said seat frame relative to said base structure.

3,883,173

SEAT WITH THIGH SUPPORT

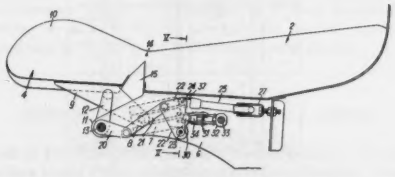
Bernard William Shephard, Basildon, and Kenneth George Draper, Burnham-on-Crouch, both of England, assignors to Ipeco Europe Limited, Essex, England

Filed Jan. 26, 1973, Ser. No. 327,144

Claims priority, application United Kingdom, Feb. 2, 1972, 4819/72

Int. Cl. B60n *1/02*; **A47c** *1/034*

U.S. Cl. 297—312 **9 Claims**



1. An upholstered seat comprising: a main seat portion having upper and lower surfaces, a forward end and individual thigh support portions each of which includes an upper and lower surface, biasing means individually and resiliently urging each of said thigh support portions upwardly into an upper support position, each of said thigh support portions being independently movable with respect to the other, said individual thigh support portions being located in juxtaposition with the forward end of said main seat portion at opposite sides thereof, individual strut means in fixed relation with each of said thigh support portions and extending downwardly therefrom and including guide pins, a frame member in fixed relation with said main seat portion, said frame member including a pair of elongate slots in which said guide pins are slidably received, a linkage assembly operatively connecting said biasing means to the thigh support portion associated therewith, said linkage assembly including a pivotally mounted lever means having one end mounted to one of said strut means and another end to a connecting link which is in turn operatively connected to said biasing means, said linkage assembly being disposed below the lower surface of said thigh and main seat portions, said guide pins, elongate slots and linkage assembly cooperating to direct the movement of said thigh support portions along an arcuate path about a pivot axis located adjacent the upper surface thereof at said upper surface of said main seat portion, each of said thigh support portions being movable downwardly along said arcuate path upon the application of a load to it from above, whereby said individual thigh support portions are individually resiliently loaded upwardly and individually movable with respect to each other about said pivot axis adjacent the upper surfaces thereof without the presence of a pivotal hinge at said pivot axis.

3,883,174

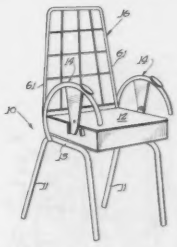
ADJUSTABLE CHAIR

Joan C. Roscoe, 27 Merryfield Ave., Waterville, Maine 04901

Filed Aug. 5, 1974, Ser. No. 495,035

Int. Cl. A47c *1/02*

U.S. Cl. 297—355 **4 Claims**



1. A chair comprising:

a pair of spaced apart inverted generally U-shaped leg members each having a top bight portion;

a horizontal seat resting on the bight portions and secured thereto;

a pair of arm rests, one arm rest associated with each leg member and having one end fixedly attached to a back end of the associated leg member bight portion with the arm rest projecting upwardly and forwardly therefrom in an arcuate semi-circular manner;

a passageway defined interiorly of each arm rest member and extending axially therethrough;

a tubular member telescopically received in each of the arm rest passageways and movable axially therealong;

control means associated with each arm rest member and engagable with each tube member telescopically received therein to selectively lock the tube member in any selected telescopic position therein;

a pair of bracket members, each bracket member associated with one of the tubular members at a central portion thereof and extending outwardly therefrom through appropriate slots in the arm rest members to a position adjacent opposite sides of the seat;

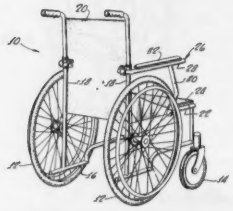
pivot means pivotally connecting the projecting free end portion of each bracket to the seat for guided pivotal movement of the bracket thereabout;

a pair of stop members associated with the terminal end of each bracket on each side of the seat, the stop members being disposed in front and in back of the leading and trailing edges respectively of the terminal edge to limit the maximum rearward and forward angular pivotal movement of the bracket relative to the seat; and

a generally flat back rest member including side supports interconnected by a top edge and a bottom edge and extending intermediate the arm rest members adjacent the back end portions thereof, each side edge being fixedly attached to an adjacentmost end of the telescopic tubular member within the associated arm rest member for simultaneous movement therewith as permitted by an arcuate slot extending through a side wall portion of the arm rest member at the back portion thereof;

whereby telescopic movement of the tubular member forwardly of the arm rest members effects the movement of the back rest member to a maximum upright position as determined by the stop member engaging the trailing edge of the bracket, and sliding telescopic movement of the tubular member rearwardly of the arm rest members places the back rest member at any selected reclined position up to a maximum reclined position determined by the stop member engaging the leading edge of the support brackets.

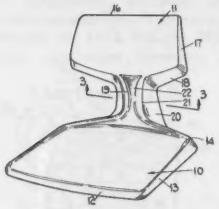
3,883,175
SWING-BACK DETACHABLE WHEELCHAIR ARMREST
Keith S. Rodaway, Culver City, Calif., assignor to Everest & Jennings, Inc., Los Angeles, Calif.
Filed Aug. 23, 1973, Ser. No. 390,754
Int. Cl. A47c *7/54*
U.S. Cl. 297—416 **5 Claims**



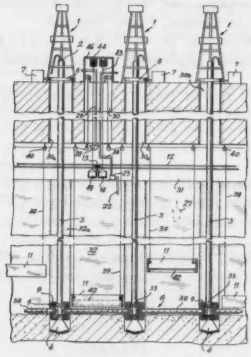
1. A removable rotatable wheelchair armrest assembly comprising:
a wheelchair frame;
an arm support member having one end connected to said wheelchair frame;
a stabilizer leg having one end connected to said arm support member;
means on said one end of said arm support member for releasably locking said arm support member to said wheelchair frame to allow removal of said arm support member and stabilizer leg from said wheelchair frame; and
a holding bracket attached to said wheelchair frame and having an opening for receipt of said one end of said arm support member, said bracket has a tubular sleeve into which said one end of said arm support member having a tubular shape is placed, resulting in a rotatable connection between said arm support member and said bracket, said arm support member being retained in said bracket by a spring-biased button connected to said one end of said arm support member.

3,883,176
CHAIR SHELL
Philip Hugh Morton, Kidderminster, England, assignor to Pel Limited, Worcestershire, England
Filed Jan. 14, 1974, Ser. No. 433,103
Claims priority, application United Kingdom, Jan. 23, 1973, 3389/73
Int. Cl. A47c *3/00, 7/02*
U.S. Cl. 297—457 **4 Claims**

1. A one piece chair shell comprising a seat portion connected to a backrest portion by at least one connecting section which is vertically corrugated and which is substantially narrower than the seat portion and the backrest portion with the vertical corrugations facilitating support of the substantially narrower connecting section and the remainder of the chair shell.



3,883,177
DIAMOND DRILL AND ROCK FRAGMENT EXCAVATION DEVICE
Petru C. Baciu, 48-20 48th St., Woodside, Queens, N.Y. 11377
Filed Jan. 23, 1974, Ser. No. 435,697
Int. Cl. E21b *3/02, 9/36*
U.S. Cl. 299—19 **4 Claims**

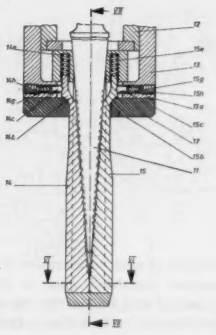


1. A rock drilling device comprising in combination: a tubular element having inner and outer tubular surfaces and defining a plurality of coolant-flow apertures through the tubular walls of the tubular element with the apertures defining a coolant flow path from within the tubular element to laterally exterior thereof, the apertures extending substantially radially outwardly from the longitudinally axially extending tubular coolant flow path within the tubular element, there being diamond cutting bits arranged along the outer tubular surfaces with the apertures substantially adjacent the diamond cutting bits, and bevel gear means and drive shaft means with the drive shaft means extending along its longitudinal axial axis at an angle laterally relative to the tubular element's longitudinally axially extending axis and the shaft means being operatively connected through the intermediate bevel gear means for driving rotatably the tubular element around the tubular element's longitudinally axially extending axis as a result of force transmitted by the drive shaft means to and through the bevel gear means, and the tubular element being supportable by the bevel gear means and the bevel gear means being supportable by the drive shaft means.

3,883,178
HYDRAULICALLY ACTUATED APPARATUS FOR THE MECHANICAL SPLITTING OF STONES

Helmut Darda, Im Tal/Brd, 7712 Blumberg, Germany

Filed June 15, 1973, Ser. No. 370,470
Claims priority, application Germany, June 20, 1972, 2229940
Int. Cl. E21c 37/04
U.S. Cl. 299—22 26 Claims

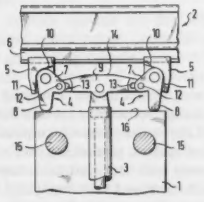


1. In an apparatus for the mechanical splitting and fracturing of stone, comprising a cylinder block; a hydraulically actuatable piston longitudinally movable in said cylinder block; a piston rod connected to said piston; a slide wedge fastened to said piston rod; an intermediate member on said cylinder block; and pressure wedges adapted to be set into bore holes in said stone, said intermediate member forming a mechanical connection between said apparatus and said pressure wedges, said pressure wedges being sideways movable at a deflection conforming to the slope of said slide wedge, the improvement comprising; prestressed return spring means; said pressure wedges being connected to said intermediate member so as to be axially displaceable relative thereto in opposition to the force of said return spring means.

3,883,179
ROOF SUPPORTS FOR LONG WALL MINING INSTALLATIONS

Manfred Flöter, deceased, late of Altlunen, Germany (by Hannelore Emmi Floter, administratrix); Franz Beulker, Werne; Lubomir Plevak, Lunen, and Kunibert Becker, Werl, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed July 25, 1973, Ser. No. 382,600
Claims priority, application Germany, Aug. 1, 1972, 2237798
Int. Cl. E21c 29/02
U.S. Cl. 299—321 11 Claims

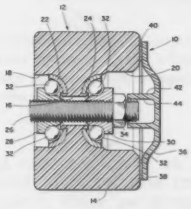


1. In a winning installation comprising a conveyor and a mineral winning machine guided for movement thereon, a long wall support system including at least one support unit comprising a frame, an advancing ram mounted to said frame, and means connecting said ram and said conveyor, said means comprising a cross head on said ram, a pair of bell-crank levers, support means carried by said conveyor and pivotally mounting said bell-crank levers one on each side of said ram, each of said bell-crank levers having a first arm anticulated to said cross head and a second arm forming an adjustable stop for said support unit extending between said unit and conveyor and being pivotable between a position extending obliquely of the length of the conveyor and a position extending normally of the length of the conveyor.

3,883,180
WHEEL HUB CAP FOR SKATE WHEELS

Calvin L. Kain, 1325 Rockdale Rd., Bartlesville, Okla. 74003

Filed Oct. 1, 1973, Ser. No. 402,045
Int. Cl. B60b 7/06
U.S. Cl. 301—5.3 4 Claims

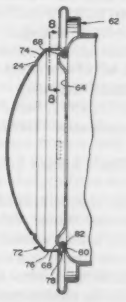


1. In combination with a skate wheel rotatably secured to an exposed wheel axle and axle nut threadedly disposed thereon, a wheel hub cap comprising a substantially dish shaped body having an annular surface provided around the outer periphery of the concave face thereof, means provided on said annular surface for removably securing the hub cap body to the exposed face of the skate wheel, said means for removably securing the hub cap body to the exposed face of the skate wheel comprising a pressure sensitive adhesive.

3,883,181
DECORATIVE WHEEL COVER AND RETAINING ASSEMBLY THEREFOR

William K. Dissinger, Muncy, Pa., assignor to Plastaspec, Inc., Harrisburg, Pa.

Filed Apr. 5, 1972, Ser. No. 241,303
Int. Cl. B60b 7/00
U.S. Cl. 301—37 P 13 Claims



1. A decorative wheel cover for mounting on a wheel assembly of a vehicle comprising a display portion; decorative means displayed by said display portion; a skirt portion de-

pending from said display portion; and a lip portion extending from the bottom peripheral edge of said skirt portion and including an annular bead extending radially inwardly toward the center of said wheel cover; said display portion, said skirt portion and said lip portion being integrally formed of a resilient thermoplastic material whereby the wheel cover may be flexed to facilitate mounting, said material permitting passage of light rays therethrough, and said lip portion including a radially inwardly directed wall folded upon itself to form said bead, said bead having a curved surface configuration in cross section.

3,883,182

SIDEWALL TRIM MEMBERS

J. Haywood Barnes, 283 Tolbert St., Wadsworth, Ohio 44281

Filed Mar. 21, 1973, Ser. No. 343,434

Int. Cl. B60b *7/00*

U.S. Cl. 301—37 TC **8 Claims**

1. An annular sidewall trim member for a pneumatic tire comprising a resilient outer section for engaging part of a tire sidewall, and a radially inner annular anchor section, both of said sections being formed from elastomer but with said anchor section having reenforcing means therein to prevent radial expansion thereof, said trim member being adapted to engage a tire and wheel combination to be secured thereto by said anchor section and by a wheel covering engaging the wheel, said anchor section being thinner than said outer section and having a portion of smaller diameter than the tire bead engaging portion of a rim with which the trim member is to be used, said anchor section extending radially beyond the wheel cover when the member and cover are operatively positioned on a wheel.

3,883,183

INSTALLATION FOR THE CONTROL OF THE BRAKE SLIPPAGE AND FOR THE PREVENTION OF THE LOCKING OF WHEELS OF VEHICLES, ESPECIALLY MOTOR VEHICLES

Manfred H. Burckhardt, Waiblingen; Hellmut Krohn, Esslingen; Horst Grossner, Geradstetten, and Hans-Jorg Florus, Goppingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

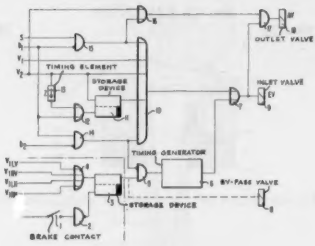
Filed Apr. 21, 1972, Ser. No. 246,276

Claims priority, application Germany, Apr. 21, 1971, 2119293

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 P **10 Claims**

1. An installation for the control of the brake slippage of vehicle wheels, especially motor vehicle wheels, in which pulse transmitter means are coordinated to the wheels whose pulses are processed into signals in a circuit system connected to the output of the pulse transmitter means and in which the thus obtained signals act on control means in pressure medium circuit means of the wheel brakes in such a manner that the pressure at the wheel brakes is being built up, held or decreased, and which includes means for controlling the recommencement of the pressure build-up and means for influencing the pressure build up, characterized in that the means for controlling the recommencement of the pressure build-up includes time-limit means responsive to the attainment of a deceleration threshold value for enabling the recommencement of the pressure build-up within a predetermined period



after the attainment of said deceleration threshold value unless an acceleration threshold value is attained within the predetermined period and in that the means for influencing the pressure build-up includes a timing generator means.

3,883,184

MONITORING DEVICE FOR ANTI-LOCK CONTROL SYSTEM

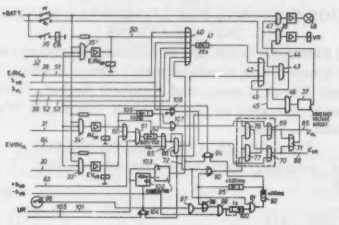
Wolf-Dieter Jonner, Heidelberg; Heinz Leiber, Leimen, and Wolfgang Korasiak, Ketsch, all of Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed June 26, 1973, Ser. No. 373,778

Claims priority, application Germany, June 30, 1972, 2232034

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 AF **17 Claims**

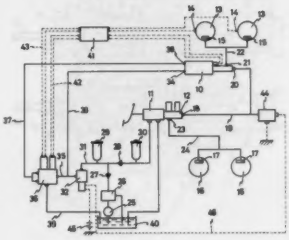


2. A monitoring device for an anti-lock control system for vehicles comprising: first means for monitoring the duration of the response of the brake pressure controlling element of said anti-lock control system; second means for generating a signal if said first means indicates that said response duration is in excess of a predetermined time limit; and third means, which receives said signal, for causing the anti-lock control system to become ineffective after a given further period of response of said brake pressure controlling element and for causing alternate reduction and build up of the brake pressure during said further period.

3,883,185
ANTI-SKID CONTROL APPARATUS

Masami Inada, Aichigun, and Toshiyuki Kondo, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed June 28, 1973, Ser. No. 374,524
Claims priority, application Japan, July 25, 1972, 47-74281
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 F **6 Claims**



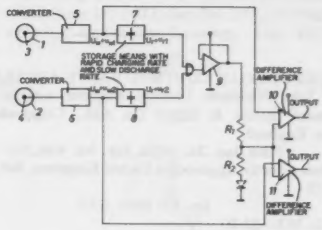
1. An apparatus for anti-skid brake pressure control in a hydraulic wheel brake system of an automotive vehicle with wheels comprising in combination:
a master cylinder,
a plurality of wheel brake cylinders,
a fluid pressure circuit between said master cylinder and said wheel brake cylinders,
a plurality of sensors for providing signals according to the number of rotations of said wheels,
an anti-skid fluid pressure control means disposed within said fluid pressure circuit,
a power fluid pressure source for actuating said anti-skid fluid pressure control means,
a control valve means disposed between said anti-skid fluid pressure control means and said power fluid pressure source operable by the signals from said sensors for controlling said anti-skid fluid pressure control means, and
a cut valve means disposed between said power fluid pressure source and said control valve means for interrupting fluid communication therebetween when no brake pressure is applied and for establishing fluid communication therebetween when the brake pressure exceeds a predetermined value.

3,883,186
ANTI-LOCK CONTROL SYSTEM

Anton Rodi, St. Ilgen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Dec. 14, 1973, Ser. No. 424,804
Claims priority, application Germany, Dec. 23, 1972, 2263284
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 BE **3 Claims**

1. An anti-lock control system for the wheel brakes of vehicles over a desired speed range, comprising:
a. first means for generating vehicle speed-dependent reference values each composed of a constant value portion and a vehicle speed-dependent value portion and forming, when plotted against vehicle speed, a reference value curve having a slope of a particular sign;
b. second means for generating wheel speed-dependent values as a function of the speed of a given wheel of the vehicle, each wheel speed-dependent value being composed of a constant value portion larger than said constant value portion of the vehicle speed-dependent reference values and a value portion dependent upon the speed of said given wheel, said wheel speed-dependent values forming, when plotted against vehicle speed, a wheel speed-dependent value curve having the same sign as said reference value curve and not intersecting said reference value curve in said desired speed range in the absence of slip of said given wheel;
c. comparison means for comparing said reference values with said wheel speed-dependent values; and

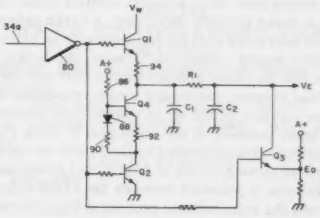


d. control means responsive to said comparison means for varying the brake pressure at the wheel brake of said given wheel when the wheel speed-dependent value falls below the reference value.

3,883,187
EXPONENTIAL GENERATION IN AN ADAPTIVE BRAKING SYSTEM BY CHARGE TRANSFER

Ralph W. Carp; Robert E. Weber, and Bertice E. Walker, all of Newport News, Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 29, 1974, Ser. No. 464,867
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 P **7 Claims**



1. In an adaptive braking system for wheeled vehicles using speed logic wherein a first speed signal correlated to the speed of some structure of said vehicle is generated and a reference speed signal related to said first speed signal is generated and wherein a braking force modulator responds at least in part to a predetermined relationship of at least one of said first speed and said reference speed signals with another signal, means for generating said another signal comprising:
a first charge storage means;
a second charge storage means, said another signal being generated across said second charge storage means;
means for conveying charges from said first charge storage means to said second charge storage means, said first charge storage means, said second charge storage means and said means for conveying charges comprising a time constant circuit;
a source of relatively constant potential;
switching means for normally impressing said relatively constant potential on said second charge storage means and for simultaneously impressing a signal related to said first speed signal on said first charge storage means; and,
means for generating an initiate signal at a predetermined point in the brake control cycle of said adaptive braking system, said switching means being responsive to said

intiate signal for interrupting communication of the signal related to said first speed signal from said first charge storage means and for interrupting the application of said relatively constant potential to said second charge storage means, whereby the charges stored on said first and second charge storage means will equalize through said means for conveying to thereby generate said another signal.

3,883,188

EMPTY/LOAD CONTROL VALVE APPARATUS

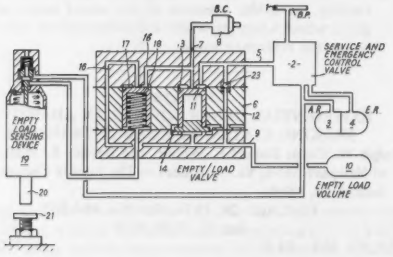
David John Wickham, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., Chippenham, Wiltshire, England

Filed Jan. 24, 1974, Ser. No. 436,393

Claims priority, application United Kingdom, Feb. 16, 1973, 7635/73

Int. Cl. B60t *8/20*

U.S. Cl. 303—23 R **7 Claims**



1. An empty-load fluid pressure control valve apparatus including a brake pressure input port, a brake cylinder pressure output port and a port for connection to an extra volume, cut-off valve means connected between the brake pressure input port and the brake cylinder output port and operable by a differential pressure responsive means responsive in operation to the pressure of the extra volume port predominating over the brake pressure at the input port to close the cut off valve, a further valve controlled by fluid pressure applied from an empty-load sensing device to hold closed a communication which otherwise is provided between the brake cylinder output port and the extra volume port for a loaded condition.

3,883,189

SAFETY INSTALLATION FOR TWO CIRCUIT BRAKE SYSTEMS OF MOTOR VEHICLES

Erich Braun, Rielinghausen, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

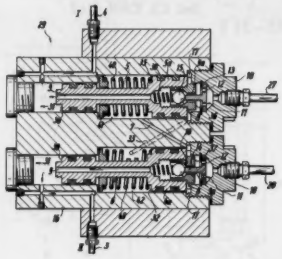
Filed Aug. 16, 1973, Ser. No. 389,030

Claims priority, application Germany, Aug. 16, 1972, 2240095

Int. Cl. B63t *11/20*

U.S. Cl. 303—84 R **12 Claims**

1. A safety installation for two-circuit brake systems of motor vehicles with master cylinder brake means and two brake circuit means, each brake circuit means including and independent line system with a main line and independent wheel brake cylinder means, the installation comprising: housing means, pressure space means provided in said housing means for each brake circuit means, line means for communicating each of said pressure space means with the master cylinder brake means, differential piston means constructed as a pressure amplifier disposed in each of said pressure space means and coordinated to each brake circuit means, a throughflow bore extending through a respective differential piston means substantially coaxially with its longitudinal axis, a valve means disposed at one end of the throughflow bore of each differential piston means, the valve means being operable to automatically close or open the respective throughflow bores in dependence on a pressure drop in one of the brake circuit means, and line means for communicating the upstream side of each of the valve means in a pressure space means with the other pressure space means on the downstream side of the valve means disposed in the other pressure space means.



3,883,190

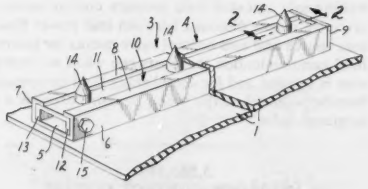
SNOWMOBILE TRACTION CLEAT AND DRIVE BELT

James Anthony Kilbane, Jr., Rt. 1, Smithtown, Bay Rd., Excelsior, Minn. 55331

Filed Oct. 3, 1973, Ser. No. 403,014

Int. Cl. B62d *55/28*

U.S. Cl. 305—35 EB **17 Claims**



1. A traction cleat for a snowmobile comprising:

a. a first channel-shaped structure comprising a base, a pair of legs attached to and extending outwardly from said base on oppositely disposed longitudinal margins of said base and a top means attached to said legs at the ends of said legs opposite to those attached to said base for holding a second member in said first channel-shaped structure and for allowing projections of the second member to project beyond said first channel-shaped structure,

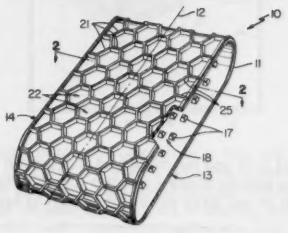
b. a second member comprising a base having at least one projection extending from the upper surface of said base, said second member being held within said first channel-shaped structure, and slidably removable therefrom with said projection of said second member extending through said top means of said first channel-shaped structure and the upper surface of said base of said second member contacting said top means of said first channel-shaped structure, and

c. securing means for holding said second member from any substantial movement in the longitudinal direction of said first channel-shaped structure.

3,883,191
ENDLESS TRACK

Guy Noel Chaumont, Tring-Jonction, Quebec, Canada, assignor to Dayco Corporation, Dayton, Ohio

Filed Apr. 8, 1974, Ser. No. 458,958
Int. Cl. B62d 55/25
U.S. Cl. 305—35 EB 9 Claims

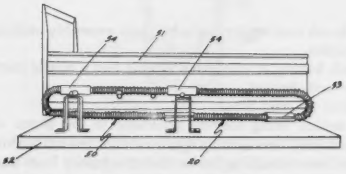


1. An endless track having a main body made of an elastomeric material and being adapted to be moved in an endless path having a longitudinal axis, said main body comprising an inner surface and a ground engaging outer surface; said outer surface including a central portion comprising a plurality of ribs defining regular hexagonal cells, each of said cells having ribs arranged at an acute angle with said axis to provide continuous support for said track; said outer surface further comprising side ribs defining the outermost edges of said track, said side ribs and the adjacent angled ribs forming nonsymmetrical cells outward of said central portion.

3,883,192
MOVEMENT DEVICE

Frederick S. Falks, Comstock Park, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Nov. 29, 1972, Ser. No. 310,411
Int. Cl. F16c 17/00
U.S. Cl. 308—3.6 36 Claims

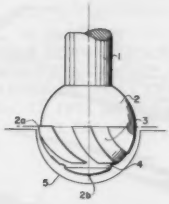


1. A movement device for facilitating the movement of one object with respect to another, said device comprising: a rigid, rod-like support including at least one change of direction in its configuration; a flexible sleeve slidably carried on said support; first and second mounting means for mounting first and second objects respectively to said flexible sleeve; said first and second mounting means being connected to said flexible sleeve at points on opposite sides of a point at which said rigid support changes direction whereby when said sleeve is slid on said support, said first and second mounting means travel in different directions, thereby causing said first and second objects to move relative to one another.

3,883,193
PEDESTAL BEARING WITH SPIRAL GROOVES IN THE BEARING GLIDING PLANE

Wolfgang Hepp, Immenstaad; Klaus Pimiskern, Friedrichshafen, and Werner Herbert, Markdorf, all of Germany, assignors to Dornier System GmbH, Friedrichshafen, Germany

Filed June 25, 1973, Ser. No. 373,137
Claims priority, application Germany, Aug. 11, 1972, 2239624
Int. Cl. F16c 35/00
U.S. Cl. 308—9 2 Claims



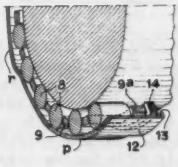
1. In an axial friction bearing comprising a stationary ball socket and a spherical bearing part provided on the surface thereof with spiral grooves, said spiral grooves terminating in the feed direction in a recess concentric to the pole of the sphere,

the improvement comprising that said recess is a continuous annular groove in proximity to said pole, and that a smooth sphere portion is between said groove and said pole.

3,883,194
DEVICE FOR MOUNTING A RADIAL ROLLING BEARING

Alfred Pitner, Paris, France, assignor to Nadella, France, a part interest

Filed July 23, 1973, Ser. No. 381,395
Claims priority, application France, July 24, 1972, 72.26534
Int. Cl. F16c 43/00
U.S. Cl. 308—184 23 Claims



1. A device for mounting a radial rolling bearing having rolling elements, comprising an elastically yieldable elastomeric collar, a thin sleeve engaged in the collar and having an inner surface which acts as a raceway for the rolling elements and defines in a plurality of angularly spaced regions a reduced clearance for the rolling elements, the collar defining an inner surface and the sleeve defining an outer surface which is coextensive with and in intimate contact with the inner surface of the collar throughout the periphery of the sleeve, the sleeve having such thinness that the sleeve has an elasticity allowing said regions to deform radially under the action of forces transmitted by the rolling elements, the sleeve being preformed in accordance with an irregular profile which defines circumferentially alternate cylindrical segments having a diameter providing a conventional radial clearance for

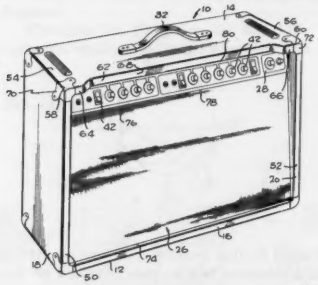
the rolling elements and cylindrical segments which are inwardly offset and constitute regions defining a reduced radial clearance for the circulation of the rolling elements.

3,883,195

SPEAKER UNIT HAVING RECESSED CONTROL PANEL

Thomas A. Walker, Tustin, Calif., assignor to Music Man, Inc., Anaheim, Calif.

Filed Oct. 5, 1973, Ser. No. 404,094
Int. Cl.[2] A47B *81/06*
U.S. Cl. 312—7 R **8 Claims**



1. A portable cabinet for housing a loudspeaker and electrical controls therefor, said cabinet having opposite sides of like size and shape with each of the sides having front and top edges intersecting at a top-front corner thereof, the front edges of said sides lying within and defining a front plane for the cabinet and the top edges of said sides lying within and defining a top plane for the cabinet with the front and top planes intersecting along a line extending between the top-front corners of the sides, a control panel having a plurality of manually manipulated elements extending therefrom, the control panel extending through substantially the entire distance between the opposite sides of the cabinet and being mounted adjacent and generally parallel to the line of intersection between the front and top planes so as to be manually accessible through the front and the top planes, said panel being disposed so that all parts thereof including the manually manipulated elements are inside both the front plane and the top plane.

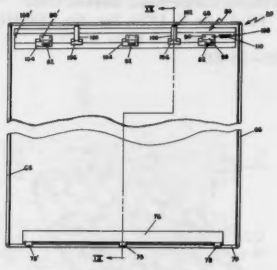
3,883,196

END PANEL SUPPORT SYSTEM

Robert G. Mohr, Grand Rapids; Ronald R. Hodges, Granville; Jack Hockenberry; Douglas Scheerhorn, both of Grand Rapids, and Gale F. Wilcox, Wayland, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Division of Ser. No. 366,218, June 1, 1973. This application Oct. 11, 1974, Ser. No. 514,062
Int. Cl. A47b *17/00, 19/00, 43/00*
U.S. Cl. 312—194 **3 Claims**

1. A system for supporting one or a number of standardized furniture components as desks, tops, cabinets or the like comprising: a supported member; end panel members adapted to support said supported member; first securing means in said end panels and said supported member for releasably securing same together; cover members for said end panels; and second securing means in said cover members and said end panels for releasably securing said cover to said panel whereby said cover members can be readily removed for access to said securing means; said second securing means includes tabs on said cover members and first slots on said end panel for receiving said tabs, said tabs including engaging means for holding said tabs in place in said first slots, a second slot adjacent and below each said first slot thereby defining a bridge between each of said first and second slots, said bridge being of a bendable material whereby it can be bent in or out, up or down by inserting a tool into an appropriate one of said first



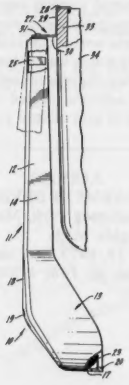
and second slots and operating said tool against said bridge, said bridge thereby forming a means for adjusting said cover member in or out, up or down with respect to said end panel.

3,883,197

BOWL BRUSH ASSEMBLY

Joyce Pruitt Reid, 1316 W. 115th St., Chicago, Ill. 60643

Filed May 31, 1973, Ser. No. 365,492
Int. Cl. A47g *29/08*; A46b *17/00*
U.S. Cl. 312—206 **4 Claims**



1. A brush and holder assembly, said assembly including, in combination,

a brush having an elongated handle and a bristle portion at one end thereof,

a holder for said brush,

said holder being formed generally in the shape of said brush and having an open, unobstructed entry side,

means for suspending the brush in the holder from a support location integral with the holder which maintains the bristle portion out of contact with the holder, and

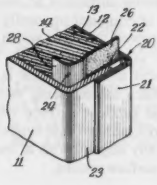
means for connecting said brush and holder assembly from an anchor location which enables said assembly, when not in use, to be disposed with the open, unobstructed entry side of the holder facing an adjacent vertical surface, such as the vertical wall of a water closet tank to which the assembly is anchored,

said connecting means further enabling the brush and holder assembly to be unrestrainedly rotated and tilted with respect to the adjacent vertical surface whereby the brush may be freely inserted into, and removed from, the holder, and the holder disposed in a position in which the open entry side faces the adjacent vertical surface.

3,883,198
CABINET CONSTRUCTION

Harry L. Tillman, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 7, 1973, Ser. No. 395,634
Int. Cl. A47b *96/04*; **F25d** *23/06*
U.S. Cl. 312—214 **9 Claims**

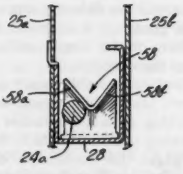


1. A cabinet construction comprising: a first wall; a second wall spaced from said first wall to define an expansion space therebetween provided with foamed-in-place insulation; a U-shaped flange on one of said walls extending and opening toward the other wall at an end of said space, said U-shaped flange having an inner leg defining an inner surface adjacent said expansion space and having a distal edge spaced from said other wall; a turned end portion on the other of said walls slip fitted between the legs of said flange; and a flexible tape in said expansion space having a first portion facially engaging said inner surface of said inner leg and a second portion facially engaging said turned end portion of the other of said walls and sealing said end of said expansion space against expansion of the insulation between said slip fitted turned end portion and flange legs during foaming-in-place thereof, one of said tape portions being adhesively secured to its engaged wall and the other of said tape portions being freely facially slidable relative to its engaged wall.

3,883,199
FILE DRAWER INTERLOCKING AND LOCKING MECHANISM

Charles R. Cawley, Jr., Barto; Gerald M. Wiseman, Hatfield, and John T. Gabel, East Greenville, all of Pa., assignors to Knoll International, Inc., New York, N.Y.

Filed July 25, 1972, Ser. No. 274,969
Int. Cl. E05b *65/46*; **E05c** *15/04, 13/04*
U.S. Cl. 312—216 **10 Claims**

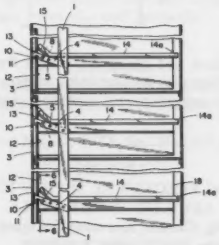


1. A file drawer interlocking mechanism comprising an elongated rod pivotal about a longitudinal axis between drawer closed and drawer opened positions and extending parallel to one of the sides of each of a plurality of drawers of a multi drawer file and carrying a plurality of projections thereon spaced from and parallel to the rod and each positioned closely adjacent to a corresponding one of said drawer sides, channel means on each of said drawer sides and positioned closely adjacent to and operatively associated with a corresponding one of said projections in the closed position of the drawer, each channel means having opposed sides defining a channel through which the corresponding projection passes as the drawer is moved between closed and opened positions, one of the sides of each channel engaging the corresponding projection to pivot said elongated rod about said axis from said drawer closed position to said drawer opened position as the projection moves through the corresponding channel during the opening of the corresponding drawer when all other drawers are in closed positions, the opposite side of each channel engaging the corresponding projection to pivot said elongated rod from said drawer opened position to said drawer closed position as the projection moves through the corresponding channel during the closing of the corresponding drawer when all other drawers are in closed positions, and each channel means having a striking surface which strikes the corresponding projection when the corresponding drawer is in the closed position but said elongated rod is in the drawer opened position to prevent the opening of any closed drawer when another drawer is in an opened position.

3,883,200
FILE DRAWER LOCK

Ernest W. Latham, North Aurora, Ill., assignor to Bentson Industries Inc., Aurora, Ill.

Filed Dec. 12, 1973, Ser. No. 424,003
Int. Cl. E05b *65/46*
U.S. Cl. 312—216 **5 Claims**



2. A lock mechanism for a plurality of associated drawers, including a latch lever having a latch end and a lift end associated with each drawer, a latch catch mounted for latching cooperation with each of said latch levers, a projecting cam and a projecting rib mounted to form a continuous guide along each drawer, a following roller element rotatably mounted near the latch end of each of said latch levers for guidable engagement with a corresponding said projecting cam and projecting rib, and a gravity biased locking bar interconnecting the lift ends of said latch levers associated with each drawer, said locking bar being mounted for reciprocal movement between a locking position and an unlocking position, said locking bar being raised to locking position upon movement of a drawer out of said pre-selected alignment whereby said projecting cam and rib engage said corresponding following roller element and depress the latch end of said latch levers, said locking bar being lowered to unlocking position by virute of its gravitational bias upon disengagement of said following roller element from said projecting rib and cam when said drawer is moved back into said preselected alignment.

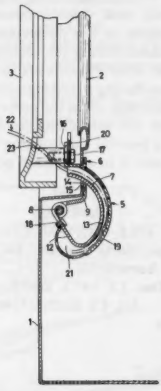
3,883,201
WASHING MACHINE ON THE LOADING DOOR OF WHICH IS MOUNTED AN ELECTRICALLY OPERATED COMPONENT

Luciano Busoni, La Spezia, Italy, assignor to San Giorgio Elettrodomestici S.p.A., La Spezia, Italy

Filed June 7, 1973, Ser. No. 367,948
Claims priority, application Italy, Oct. 20, 1972, 30747/72
Int. Cl. A47b *81/00*; **H05k** *5/03*; **D06f** *39/14*
U.S. Cl. 312—223 **8 Claims**

1. A machine comprising a housing, an opening in said housing, a door, a hinge mounting said door for movement between a position closing said opening and an open position,

said hinge including a hinge pin fixedly carried by said housing and a hinge flange pivotally carried by said hinge pin and fixedly secured to said door, at least one electric cable extending from said door and along said hinge flange to a point adjacent said hinge pin, and retaining means carried by said hinge flange for retaining said electric cable adjacent said hinge flange.



3,883,202

DESK HAVING ELECTRICAL SUPPLY LINES WHICH ARE LAID IN THE TABLE

Karl-Heinz Konig, Giessen, Germany, assignor to Voko-Franz & Co., Pohlheim near Giessen, Germany

Filed Nov. 1, 1973, Ser. No. 411,693

Int. Cl. A47b *51/00*

U.S. Cl. 312—223 **11 Claims**

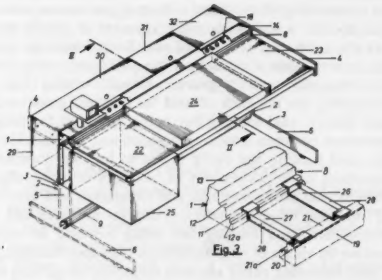


Fig. 2

1. A desk having a front and a back and two sides, comprising:

frame means comprising a pair of horizontally spaced side members and first and second horizontally spaced wall means secured to and extending between said side members;

first stepped surface means on said first wall means facing said front of said desk and second stepped surface means on said second wall means facing said back of said desk and opposing said first stepped surface means, said first and second stepped surface means each comprising a plurality of horizontally offset, vertically spaced and upwardly facing surfaces, the lowermost surface of each of said stepped surface means being spaced closer to each other than any of the remaining surfaces, each of said upwardly facing surfaces on one of said stepped surface means being coplanar with the corresponding upwardly facing surface on the other of said stepped surface means; and

a plurality of laterally spaced support surface means each including guide means slidingly mounted on a pair of said coplanar upwardly facing surfaces and adapted to slide along the length of said upwardly facing surfaces between said side members, the width of each of said support surface means being sufficient to occupy the space between said pairs of coplanar upwardly facing surfaces but no wider or narrower than the width of the spacing between a pair of coplanar upwardly facing surfaces on which said support surface means is supported, one of said support surface means being vertically spaced from the other of said support surface means to facilitate a lateral sliding movement of said support surface means to a position vertically aligned with at least one of the other of said support surface means.

3,883,203

SAFETY DEVICE FOR ARTICLE STORAGE AND RETRIEVAL APPARATUS

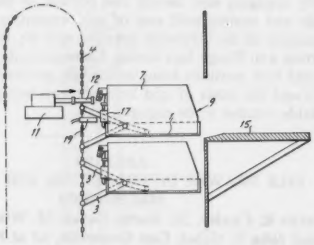
Werner Franz Lexe, Worth, Germany, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 21, 1973, Ser. No. 343,293

Claims priority, application Switzerland, Apr. 19, 1972, 5766/72

Int. Cl. A47b *49/00*

U.S. Cl. 312—268 **7 Claims**



1. A power operated article storage system comprising:

Endless carrier means carrying a plurality of carriers along an orbital path for selectively positioning the carriers at an access station;

A plurality of containers slideably supported on the carriers so that each container is slideable between a fully retracted position on the carrier and a laterally extended position from the carrier;

A plurality of locking assemblies each mounted on a respective container, said locking assemblies each including a movable locking member actuable for movement between a locking positin in which the movable locking member engages the container's carrier and thereby secures the container in the retracted position to prevent relative sliding between the container and the carrier and an unlocked position in which the movable locking member is disengaged from the container's carrier and thereby permits relative sliding between the container and carrier, and further including a lock-actuating member operatively associated with said movable locking member for moving said movable locking member between said locking position and said unlocked position in response to activation of said lock-actuating member;

Container-sliding means positioned at the access station and operatively associated with a container positioned at the access station for sliding the container between the retracted and extended positions, said container-sliding means being aligned with the lock-actuating member of the container positioned at the access station so as to

activate the lock-actutating member and thereby move its associated locking member from said locking position to said unlocked position prior to sliding the container from the retracted position to the extended position; and

Stationary sensing means positioned at the access station and aligned with the movable locking member of the container positioned at the access station for sensing the locking position of the movable locking member.

3,883,204

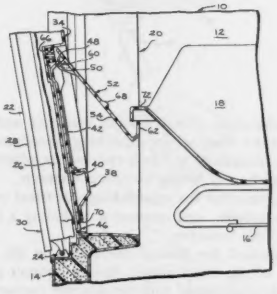
ICE BUCKET RETRIEVING APPARATUS OF A REFRIGERATOR

Luis E. Prada, and Jack M. Bryant, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Apr. 3, 1974, Ser. No. 457,481

Int. Cl. A47b *97/00*

U.S. Cl. 312—273 **6 Claims**



1. An ice bucket retrieving apparatus associated with an ice-access door of an ice-access opening of a main freezer door of a refrigerator, comprising:

a housing having a slot and being pivotally connected to the main freezer door;

an ice bucket retrieving element having an actuating arm and means for engagement with an ice bucket and being pivotally connected to the housing;

an actuating element having a trigger arm and being slidably positioned within the housing slot and movable between a first position at which the trigger arm is at a first elevation and a second position at which the trigger arm is at a second lower elevation in contact with the actuating element and the ice bucket retrieving element is pivoted outwardly therefrom; and

means for biasing the actuating element toward the second elevation of the trigger arm.

3,883,205

CONTAINER COMPRISING A BOX, A DRAWER AND A FLAP HINGED TO THE BOX

Peter Antonius Marie Ambaum, and Willem Johannes Catharina Ambaum, both of Reuver, Netherlands, assignors to B.V. Briefhouder- En Papierwaronfabriek "PAS", Reuver, Netherlands

Filed Aug. 30, 1973, Ser. No. 392,909

Claims priority, application Netherlands, Sept. 4, 1972, 7212020

Int. Cl. A47b *88/00*

U.S. Cl. 312—330 **6 Claims**

1. A container comprising:

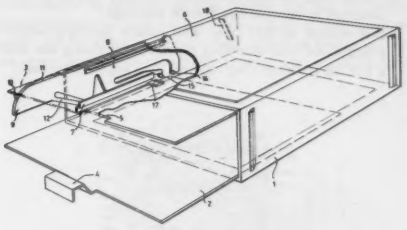
a box having a vertical side wall and defining an opening;

a pull-out drawer mounted to be inserted into and withdrawn from the box by way of said opening; a closing flap connected to the box to hinge about a horizontal axis above the pull-out drawer;

a guide means connected to said side wall;

a vertical plate arranged in the box adjacent to said side wall so as to be slidable in said guide means; and

a coupling member disposed on the drawer,



said vertical plate having an elongated resilient part which extends rearwardly and downwardly so that when the drawer is in an inserted position in the box the free end of the elongated part is below the guide means and when the drawer is moved towards a withdrawn position said elongated part cooperates with the guide means and said coupling member to displace the plate forwardly and upwardly.

3,883,206

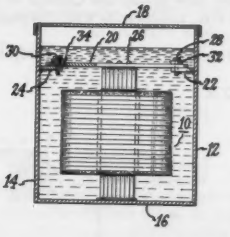
CENTERING AND ANCHORING DEVICE

Kenneth H. Baughman, Rome, Ga., assignor to General Electric Company

Filed May 7, 1973, Ser. No. 357,684

Int. Cl. H01f *15/02*

U.S. Cl. 312—351 **4 Claims**



1. A centering and anchoring device for holding an apparatus in an enclosure during use comprising an enclosure having opposed side walls, at least two brackets secured to said side walls, threaded openings in said brackets, an apparatus within said enclosure, a bar fixed to said apparatus, said bar dimensioned to overlie said brackets, said bar having enlarged openings, one said enlarged opening overlying each said threaded opening in said brackets, a bolt extending through each said enlarged opening and threaded into each said threaded opening and a conical washer mounted on each said bolt and in secure engagement with each said enlarged opening.

3,883,207

LOW INSERTION FORCE CONNECTOR FOR MODULAR CIRCUIT PACKAGES

Thaddeus K. Tomkiewicz, Bolingbrook, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Sept. 13, 1973, Ser. No. 396,822

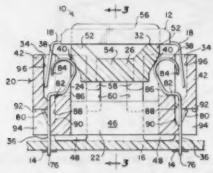
Int. Cl. H01r *13/54*

U.S. Cl. 339—75 M **13 Claims**

1. A connector for a modular circuit package including plural male leads, said connector comprising:

a housing including a base and having base wall means defining a cavity therein and a carriage mounted in said

cavity for movement between outer and inner positions;
retaining means on said base and carriage for preventing movement of said carriage from said cavity beyond said outer position;
an externally directed support surface on said carriage adapted to receive the circuit package;
recess means in said base wall means housing defining a plurality of lead receiving paths for receiving the leads of a circuit package disposed on said support surface;



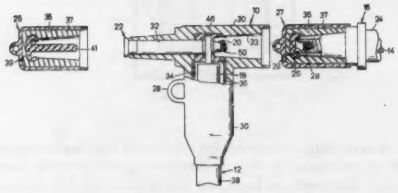
a plurality of terminals mounted in said housing, each including a spring contact normally positioned partly within said cavity adjacent one said lead receiving path and permitting unobstructed entry of a lead into said path; and
means on said carriage slidably engaging said terminals upon movement of the carriage from the outer position to the inner position and camming said spring contacts transversely into said lead receiving paths and against the inserted leads.

3,883,208

VISIBLE BREAK TEE-CONNECTOR

Edward L. Sankey, New Berlin, and Quinton H. Sutton, Waukesha, both of Wis., assignors to RTE Corporation, Waukesha, Wis.

Filed Oct. 25, 1973, Ser. No. 409,764
Int. Cl. H01r *13/54*
U.S. Cl. 339—92 R **16 Claims**



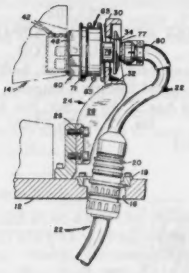
1. A visible break tee-connector for electrically connecting a high voltage cable to a bushing for an electrical device, said connector comprising:
a housing formed from a resilient insulating material,
an electrically conductive primary cable connecting element positioned in said housing, said element being electrically connected to said primary cable, and
a bushing connecting member positioned in said housing and including a body portion electrically engaging said element,
means at one end for electrically connecting said member to said bushing,
means at the other end for electrically connecting said element to ground,
and mechanical means for holding said bushing connecting member onto said element on disconnection from said bushing whereby said bushing connecting member can be grounded prior to disconnection from said bushing without disconnecting said member from said cable connecting element.

3,883,209

MISSILE CONNECTOR

Sverre Kongelbeck, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 29, 1973, Ser. No. 374,823
Int. Cl. H01r *13/60*
U.S. Cl. 339—125 R **8 Claims**



1. In combination with a missile launcher and a missile positioned in the launcher for launching therefrom, said missile having a receptacle in its aft end and an adapter secured to the receptacle and having electrical contacts,
a missile connector for establishing electrical connections with the missile, said connector including a bracket secured to the launcher,
a plug mounted for limited movement in the outer end portion of the bracket and having contact prongs displaceably engageable with the adapter contacts,
means on the plug and bracket and urging the plug toward the adapter,
and a cable system connecting the plug to a source of electric power,
said means maintaining a positive connection between the plug and the adapter when the missile is in the launcher and in the event of relative movement of the missile and launcher prior to launching, said plug separating from the adapter upon movement of the missile from the launcher.

3,883,210

SOCKET ASSEMBLY

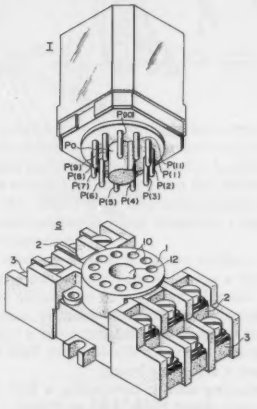
Teizo Fujita, Osaka, and Masao Kikuchi, Nabari, both of Japan, assignors to Izumi Denki Company Limited, Osaka, Japan

Filed Aug. 17, 1973, Ser. No. 389,405
Claims priority, application Japan, Aug. 18, 1972, 47-83201
Int. Cl. H01r *9/00*
U.S. Cl. 339—198 S **6 Claims**

1. A socket assembly having external lead wire connection terminals arranged in tiers at opposite ends thereof for electrically connecting terminals of an electronic component such as a relay or timer to external lead wires, comprising:
a plurality of electrically conductive connector fittings each having at one end thereof essentially upwardly extending portions and each having at the other end thereof external lead wire connection terminals for attachment to said lead wires, said upwardly extending portions each including means for attachment to said terminals of the electronic component, said plurality of connector fittings being divided into at least first and second portions;
a lower base member of electrically insulating material including first means on an upper surface of said base member removably supporting the first portion of said plurality of connector fittings each in electrically separated positions on said lower base member, said lower base member including at each of opposite end portions thereof a row of spaced seat portions individually sup-

porting the external lead wire connection terminals of the first portion of said connector fittings, whereby the first portion of said connector fittings supported on said first means may be spaced each from the other;

at least one intermediate base member of electrically insulating material mounted on said lower base member, said intermediate base member including spaced apertures aligned with each of said upwardly extending portions of the first portion of said connector fittings so that said upwardly extending portions of the first portion of said connector fittings pass through said apertures and extend upwardly from an upper surface of said upper base member, said intermediate base member including second means on the upper surface thereof removably supporting the second portion of said plurality of connector fittings each in electrically separated portions on said intermediate base member, said intermediate base member further including at each of opposite end portions thereof a row



of spaced seat portions for individually supporting the external lead wire connection terminals of the second portion of said connector fittings;

an electrical component support member of electrically insulating material mounted on said at least one intermediate base member and including spaced apertures a portion of which are aligned with each of said apertures in said at least one intermediate base member and a further portion of which are aligned with each of said upwardly extending portions of said second portion of said plurality of connector fittings; and

means for joining the intermediate and lower base members and component support member,

whereby in use said terminals of said electronic component may be inserted into said apertures in said component support member to make contact with said connector fittings and said lead wires may be attached to said external lead wire connection terminals of the first and second portions of said connector fittings.

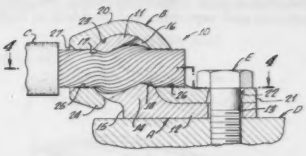
3,883,211

NON-SHEARING SOLDERLESS ELECTRICAL CONNECTOR

Alvin E. Shugarman, and Lowell E. Linder, both of Santa Ana, Calif., assignors to Electro-Clamp Corporation, Beverly Hills, Calif.

Filed Apr. 26, 1973, Ser. No. 354,645
Int. Cl. H01r *9/10*
U.S. Cl. 339—266 R **19 Claims**

1. In a solderless electrical connector of the rotatable jaw, clamping type comprising male and female jaws having respective mounting tails adapted to be secured against a support, said male jaw including a transverse cylindrical head joined to one end of said male jaw tail and having a bore which extends diametrically through the center of said head for receipt of a conductor, said female jaw including a C-shaped yoke joined to one end of said female jaw tail and defining a transverse cylindrical socket which receives said head of said male jaw for relative angular movement of said jaws between an open, conductor-receiving position and a closed, conductor-clamping position, said yoke having opposed cylindrical bores on a common diameter of said yoke which are alignable with said bore in said male jaw in said open position of said jaws, the improvement wherein the diameter of said bore in said male jaw is throughout its length slightly larger than the diameter of said bore in said female jaw to permit said conductor to expand when said jaws are rotated to said closed position.

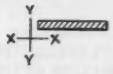


3,883,212

CONTACT FOR MULTIPLE CONDUCTOR CONNECTOR

Josef Keglewitsch, Addison, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 64,313, Aug. 17, 1970, abandoned.
This application Oct. 6, 1972, Ser. No. 295,759
Int. Cl. H01r *9/14*
U.S. Cl. 339—276 A **4 Claims**



1. A contact element for electrical connectors, formed of a single, integral piece of sheet metal, having

an active portion at one end including a flexible contact blade,

a terminal portion at the other end, and

a mounting shank between said active portion and said terminal portion, said shank being of channel shaped cross-section, with an intermediate web between two flanges,

wherein said terminal portion is characterized by a cross-section including a channel with a back web coplanar with the intermediate web of said shank, and two side flanges, one at each side of said back web and extending at right angles thereto to a width at least as great as the width of said back web, said side flanges being reentrant back upon themselves by 180° bends whereby they extend inwardly to the full depth of the channel and into close contact with said back web and with each other.

3,883,213

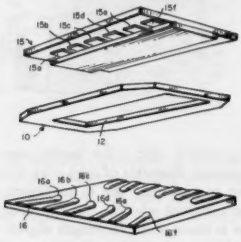
CONNECTORS

Frank J. Glaister, Ipswich, Mass., assignor to Chomerics, Inc., Woburn, Mass.

Filed Jan. 7, 1974, Ser. No. 431,389
Int. Cl. H01r *13/24*
U.S. Cl. 339—61 M **9 Claims**

1. In an electrical system comrising first and second electrical devices, each of said first and second electrical devices

having a plurality of spaced apart contacts, at least one of said plurality of contacts comprising raised land portions, a one piece sheet connector having elastomeric-like properties positioned between the devices and overlapping superimposed contacts of said first and second devices, means to compress the sheet connector between superimposed contacts of said first and second devices on opposite surfaces of said sheet connector, said sheet connector having a low resistance through the volume between superimposed contacts where compressed and a high resistance where not directly compressed between said superimposed contacts so that each pair



of superimposed contacts are electrically isolated from every other pair of superimposed contacts, said sheet connector of a thickness X and has the property that when adjacent contacts on opposite sides of said sheet are positioned as close as the distance X apart and compression is applied by pressing superimposed contacts on opposite sides of the sheet together, the resistance through the sheet between superimposed contacts is low relative to the resistance between adjacent contacts, where X is 5 to 100 mils and said sheet connector comprises a homogeneous mixture of electrically conductive particles and a non-conductive binder material having elastomeric properties.

3,883,214

PROTECTIVE ANTI-REFLECTIVE COATINGS FOR ALKALI-METAL HALIDE OPTICAL COMPONENTS

Richard A. Hoffman, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 14, 1972, Ser. No. 262,869
Int. Cl. B32b *9/04;* **G02b** *1/10, 13/14*
U.S. Cl. 350—1 **13 Claims**

1. An optical component having two faces and a circumferential edge for use at a particular wavelength comprising:

A. a substrate of a single-crystal alkalimetal halide; and

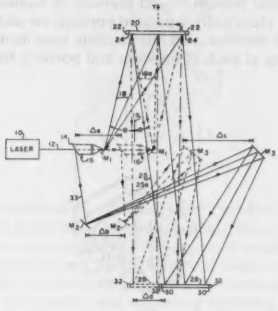
B. a first continuous coating on one of said faces and on said edge, and a second continuous coating on said other face and overlapping said first continuous coating on said edge, said coatings being selected from the group consisting of CaF_2 and MgF_2 coatings about an odd multiple of a quarter of said wavelength in optical thickness and As_2S_3 and Sb_2S_3 coatings about a multiple of a half of said wavelength in optical thickness.

3,883,215

HOLOGRAPHIC SYSTEM FOR NON-DESTRUCTIVE TESTING

Robert L. Kurz, Huntsville, Ala., assignor to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Aug. 8, 1973, Ser. No. 386,793
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **4 Claims**



1. A holographic system comprising:

a source of monochromatic light;

beam splitting means for dividing this light into an object beam and a reference beam;

first illuminating means, comprising a first mirror, for directing said object beam onto an object;

holding means for holding and positioning photosensitive material to receive light which has impinged on said object;

second illuminating means for directing said reference beam onto said photosensitive material, and comprising second and third spaced mirrors providing an optical path between said means for dividing said light and said photosensitive material;

first positioning means for adjustably positioning said first illuminating means for selectively varying the angle of illumination of said object, and comprising means for moving said first mirror along a line parallel to a reference plane corresponding to the plane of said holder and photosensitive material held therein and for selectively rotating said first mirror about an axis perpendicular to said line; and

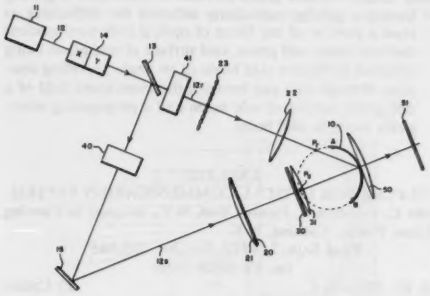
second positioning means for positioning said second illuminating means for selectively varying the angle of said reference beam on said photosensitive material, and comprising means for selectively moving said second mirror along a line parallel with said reference plane, means for selectively rotating said second mirror about an axis perpendicular to said reference plane, and means for moving said third mirror along a line parallel with said reference plane and for selectively rotating said third mirror about an axis perpendicular to said reference plane;

whereby the angles at which said beams reach said object and said photosensitive material may be selectively varied and thus the sensitivity of said system to deformation of a test object be varied and said angles may be made identical and thereby obtain interference fringes with a selected degree of detail on said photosensitive material.

3,883,216
HOLOGRAPHIC MEMORY HAVING SPHERICAL RECORDING MEDIUM

Tzuo-Chang Lee, Bloomington, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Apr. 11, 1974, Ser. No. 459,996
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 17 Claims



1. In a holographic memory having a memory medium with a plurality of locations at which holograms may be stored and having an object and a reference beam for forming holograms at each of the plurality of locations on the memory medium, and wherein the object and reference beams are directed along object and reference beam channels, respectively, the improvement comprising:

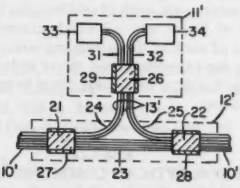
a memory medium having a curved surface proximate a portion of a sphere, the sphere having a diameter along the optical axis of the object beam channel; and

reference beam pivoting means for pivoting the reference beam about a reference beam pivot point proximate the sphere.

3,883,217
OPTICAL COMMUNICATION SYSTEM

Roy E. Love, Corning, and Frank L. Thiel, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 5, 1973, Ser. No. 376,575
Int. Cl. G02b 5/14
U.S. Cl. 350—96 C 3 Claims



1. An optical communication system comprising

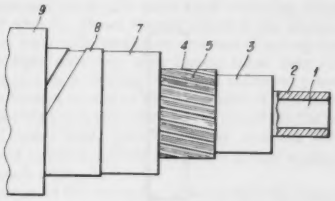
at least three stations, each of which has means for generating optical signals and means for receiving optical signals, a plurality of optical signal transmission lines having first and second ends, the number of said transmission lines being equal to the number of stations, each of said transmission lines comprising at least one optical waveguide, means for coupling the first end of each of said transmission lines to the generating means and receiving means of a corresponding one of said plurality of stations, and

passive optical coupler means connected to the second ends of each of said transmission lines for receiving optical signals from a transmission line connected to any one of said plurality of stations and coupling a portion of that signal to the transmission lines associated with all of the remaining stations.

3,883,218
OPTICAL GUIDES

Raymond Jeffrey Slaughter, Chislehurst, England, assignor to British Insulated Callender's Cables Limited, London, England

Filed Nov. 8, 1973, Ser. No. 413,823
Claims priority, application United Kingdom, Nov. 10, 1972, 52099/72
Int. Cl. G02b 5/16
U.S. Cl. 350—96 B 22 Claims

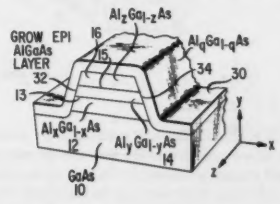


1. An optical cable comprising a central elongate non-optical reinforcing member; a plurality of elongate optical elements, each element consisting of at least one optical fibre which elongate optical elements are embedded side by side in a substantially flat tape of plastics material which is lapped helically about the reinforcing member in at least one layer; and an outer protective sheath; the position of each elongate optical element with respect to the other elongate optical elements of the or each layer being constant throughout the length of the cable, and the reinforcing member being of such a material and of such a cross-sectional area having regard to the material or materials and cross-sectional area of each optical fibre that the reinforcing member at least substantially reduces the strain that would otherwise be imparted to the optical fibres when the cable is stressed in such a way as to tend to subject any optical fibre to a tensile force.

3,883,219
DIELECTRIC OPTICAL WAVEGUIDE

Ralph Andre Logan, Morristown; Bertram Schwartz, Westfield; Joseph Charles Tracy, Jr., Bernardsville, and William Wiegmann, Middlesex, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 291,937, Sept. 25, 1972, Pat. No. 3,833,435. This application Dec. 26, 1973, Ser. No. 427,914
Int. Cl. G02b 5/14
U.S. Cl. 350—96 WG 9 Claims



1. A dielectric optical waveguide comprising:

a GaAs substrate having first and second major surfaces,

a multilayered structure comprising the following layers epitaxially grown on said first major surface in the order recited: a $Al_zGa_{1-z}As$ first layer at least one $Al_yGa_{1-y}As$ middle layer, and a $Al_zGa_{1-z}AS$ third layer, $y < x$ and z;

the width of said middle layer measured parallel to said first major surface being less than the corresponding width of said first and third layers so that said latter layers have portions which overhang the edges of the said middle layer.

3,883,220

OPTICAL SWITCH

Henry F. Taylor, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 10, 1973, Ser. No. 423,624
Int. Cl. G02b 5/14
U.S. Cl. 350—96 WG **5 Claims**

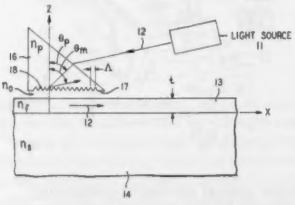
1. An optical switch comprising:
a substrate having a first refractive index;
broadband optical waveguides defined by an electrooptic material supported on predetermined portions of said substrate,
said material having a second higher refractive index and diverging from a single path into at least two spatially separated paths;
a source of electrical energy;
a pair of electrodes positioned proximate to and operatively associated with each said spatially separated path; and
means for controllably connecting said electrical energy to a selected pair of said electrodes to apply an electric field of determinable polarity across an associated spatially separated path and substantially parallel to the plane of the interface between said electrooptic material and said substrate for lowering the refractive index of said path, whereby to divert optical energy from said associated spatially separated path.

3,883,221

PORTABLE PRISM-GRATING COUPLER

William Walter Rigrod, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 1, 1974, Ser. No. 438,843
Int. Cl. G02b 5/14, 27/38
U.S. Cl. 350—96 C **10 Claims**



1. An optical coupling arrangement of the type comprising a body of optically transparent material having an index of refraction n_f and two opposing major surfaces separated by a distance proportioned for guiding a beam of optical electromagnetic radiation, and

a prism of optically transparent material having an index of refraction n_p, said prism having a surface disposed essentially parallel to and separated by a gap of index of refraction n_0 from one of the major surfaces of said body, n_0 being smaller in value than n_f and n_p, respectively, said arrangement being characterized in that

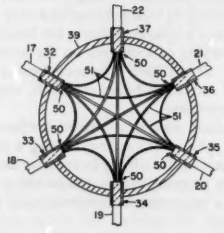
said surface of said prism includes a fixed optical grating having a grating periodicity selected for diffracting at least a portion of the beam of optical radiation incident thereon inside said prism, said surface of said prism being oriented to receive said beam at an angle providing coupling through said gap between the evanescent field of a diffracted portion of said beam and a propagating waveguide mode in said body.

3,883,222

COUPLER FOR OPTICAL COMMUNICATION SYSTEM

Leslie C. Gunderson, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 7, 1973, Ser. No. 395,165
Int. Cl. G02b 5/16
U.S. Cl. 350—96 C **11 Claims**



1. An optical coupler comprising at least four elongated transparent mixer rods, each rod having first and second planar endfaces that are substantially perpendicular to the axis thereof,

means for connecting an optical signal transmission line to the first endface of each of said mixer rods,

a plurality of bundles of optical waveguide fibers, one of said bundles being coupled to the second endface of each of said mixer rods, each of said bundles being divided into groups of fibers, one of which extends to the second endface of each of the remaining mixer rods, and

a housing for supporting said mixer rods, said plurality of bundles of optical waveguide fibers being disposed within said housing.

3,883,223

COUPLER FOR OPTICAL COMMUNICATION SYSTEM

Marshall C. Hudson, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

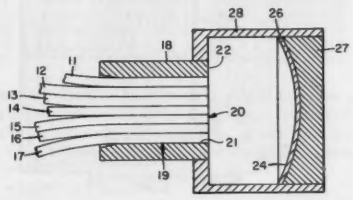
Filed Apr. 8, 1974, Ser. No. 458,786
Int. Cl. G02b 5/16
U.S. Cl. 350—96 C **6 Claims**

1. In an optical communication system having a plurality of optical signal transmission lines each comprising at least one optical waveguide having an acceptance angle θ, a coupler for coupling a portion of the optical signal propagating in any one of said transmission lines to each of the remaining transmission lines, said coupler comprising

support means for disposing the end portions of said optical signal transmission lines in a parallel bundled array having a maximum cross-sectional dimension D, the optical waveguides of which said transmission lines are comprised terminating in faces that are disposed in a substan-

tially planar array, thereby constituting a transmission line bundle endface, and

concave light reflecting means spaced from said endface and being so disposed with respect to said endface that a portion of the optical signal radiating from any one of said optical signal transmission lines reflects from said reflecting means back into each of the remaining optical signal transmission lines, said reflecting means being symmetrical about an axis that passes through the center of said



array, said reflecting means including a light reflecting surface, the cross-sectional shape of which is given by the equation

$$y = (4px)^{1/2}(1 - kx)^{1/2}$$

where k is given by

$$-1/(2p) \leq k \leq 1/(2p)$$

and p is determined by the equation

$$p = D/2 \tan \theta$$

said acceptance angle θ being an angle up to 12°.

3,883,224

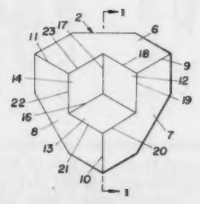
LIGHT REFLECTOR AND MOLD THEREFOR

Morimasa Tanaka, Kanagawa, Japan, assignor to Ichiko Industries Limited, Tokyo, Japan

Filed Oct. 9, 1973, Ser. No. 404,756

Int. Cl. G02b *5/12*

U.S. Cl. 350—103 **5 Claims**



1. A light reflector comprising:

an external side facing in the direction from which external light rays strike the reflector, and an internal side on the opposite side of the reflector from said external side and having thereon a plurality of light reflecting units each of which is nonagonal in plan view and which are joined to each other, and said internal side further having a plurality of light-transmitting planes each having a regular triangular shape in plan view and being surrounded by three of said light reflecting units,

each light reflecting unit being comprised of an inner triple reflecting plane structure having three flat planes joined together at right angles relative to each other and an outer triple reflecting plane structure having three flat planes joined together at right angles relative to each other, said inner triple reflecting plane structure being positioned inside said outer triple reflecting plane structure with the planes thereof joined to the planes of said outer triple reflecting plane structure along edges, each of said light reflecting units having three light reflecting elements each of which is a triple reflecting plane structure formed by one of the flat planes of said inner triple reflecting plane strucutre and the two of the flat planes of said outer triple reflecting plane structure which are joined to said one of the flat planes at right angles relative to each other,

the apexes of the triangular light-transmitting plane having apexes lying on the junction lines of the three light reflecting units surrounding said light-transmitting plane, respectively.

3,883,225

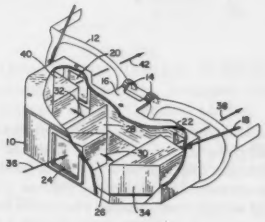
METHODS AND APPARATUS FOR TREATING ACQUIRED MYOPIA AND SIMILAR OR RELATED EYE CONDITIONS

Donald S. Rehm, R.D. 3, Box 317, Ligonier, Pa. 15658

Continuation-in-part of Ser. No. 303,464, Nov. 6, 1972, abandoned. This application Oct. 18, 1973, Ser. No. 407,460

Int. Cl. G02b *25/00;* **A61b** *3/00*

U.S. Cl. 350—146 **25 Claims**



1. Therapeutic optical apparatus comprising a housing, an objective aperture on one side of the housing, a pair of viewing apertures on the other side of said housing, means for securing said housing to the head of the user with said viewing apertures substantially in alignment with the user's eyes, lighth beam-splitting and deflecting means mounted in said housing in juxtaposition to said objective aperture, a pair of light reflectors mounted in said housing in juxtaposition to said splitting and deflecting means, said reflectors being disposed to receive respective split portions of light passing through said objective aperture and to reflect said respective split portions through said viewing apertures respectively into the

user's eyes, the reflected split portions being essentially parallel to the path of light entering said objective aperture in order to eliminate the effects of convergence and stereopsis, and lens means mounted on said housing and covering said viewing apertures for imparting an essentially zero accommodation to the eyes when viewing close work.

3,883,226

Patent Not Issued For This Number

3,883,227

LIQUID CRYSTAL DISPLAY DEVICES

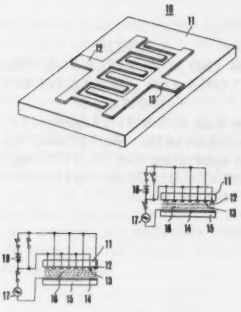
Shunsuke Kobayashi, Wako; Tokuhide Shimojo, and Kazuhiko Kasano, both of Ise, all of Japan, assignors to Ise Electronics Corporation, Ise City, Japan

Filed June 4, 1973, Ser. No. 366,969

Claims priority, application Japan, June 5, 1972, 47-55749

Int. Cl. G02f *1/28*

U.S. Cl. 350—160 LC **1 Claim**



1. An electroresponsive element for a liquid crystal display device comprising a first substrate, first and second comb shaped electrodes disposed on a common surface of said first substrate to correspond to a desired pattern with the teeth of said first and second comb shaped electrodes interleaved with each other, a second substrate spaced apart a predetermined distance from said first and second electrodes, a counter electrode supported by said second substrate to confront said first and second electrodes, a field effect type liquid crystal interposed between said first and second substrates, the electrode surfaces of said substrates being neutral respecting orientation of the molecules of said liquid crystal, and means for impressing a direct voltage across said first and second electrodes to provide initial orientation of the axes of the molecules of said liquid crystal, a source of high frequency alternating current, means operable for connecting said source of alternating current across said counter electrode and said first and second electrodes joined as a common electrode, said means for impressing and said means operable being adapted for mutually exclusive application of said direct voltage and said alternating current.

3,883,228

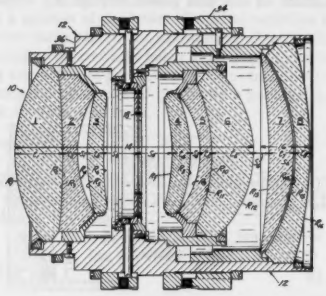
VARIABLE MAGNIFICATION ZOOM LENS

Ellis I. Betensky, Stamford, Conn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed July 9, 1973, Ser. No. 377,533

Int. Cl. G02b *15/00*

U.S. Cl. 350—184 **8 Claims**



1. An asymmetrical zoom lens providing variable magnification in a short, fixed object plane to image plane distance, comprising:

a lens barrel,

a prime lens within said lens barrel, and

a lower power, air spaced doublet within said lens barrel coaxial with and at one end of said prime lens, one of the elements of said doublet being supported for axial movement with respect to said lens barrel and the other elements, said doublet combining with said prime lens to provide a plurality of magnifications at the image plane of objects at the object plane upon synchronized movement of said lens barrel and said movable element of said doublet to a plurality of predetermined correlated positions.

3,883,229

TELEPHOTO LENS OBJECTIVE

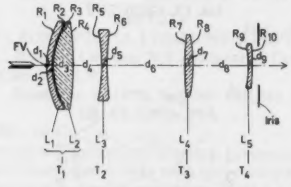
Fritz Determann, Oberkochen, and Heinz Zajadatz, Aalen, both of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed Feb. 14, 1973, Ser. No. 332,416

Claims priority, application Germany, Feb. 22, 1972, 2208163

Int. Cl. G02b *9/00*

U.S. Cl. 350—214 **11 Claims**



1. A photographic telephoto lens objective, comprising a converging first part facing the side of the longer light distance, a following diverging second part, a converging third part following at a greater distance away, and a final diverging fourth part, characterized by the fact that the optical materials for all lenses with the exception of associated lenses which are almost free of refractive power are selected from five ranges of the P** – P* presentation, in accordance with which:

$$P^{**} = \frac{N_F - N}{N_F - N_C}$$

$$P^{*} = \frac{N_F - N_t}{N_F - N_C}$$

where N is the index of refraction and the subscripts F, C, *i* and *t* represent the wavelengths of light for the blue and red hydrogen lines and for the ultraviolet and infrared mercury lines, respectively, and that for Ranges 1 to 5 the following limits apply:

Range 1:	$P^{**} = -1.933 \pm 0.021$	$P^{*} = 1.749 \pm 0.010$
Range 2:	$P^{**} = -1.724 \pm 0.021$	$P^{*} = 1.787 \pm 0.010$
Range 3:	$P^{**} = -1.863 \pm 0.021$	$P^{*} = 1.765 \pm 0.010$
Range 4:	$P^{**} = 2.091 \pm 0.021$	$P^{*} = 1.727 \pm 0.010$
Range 5:	$P^{**} = -1.925 \pm 0.021$	$P^{*} = 1.751 \pm 0.010$,

that from the optical materials so selected, lenses or lens groups are formed whose refractive powers, multiplied by the structural length assume refractive power characteristics which, for a refractive power 1.0 for the entire system, are:

A = −0.74 ± 0.18
B = +3.08 ± 0.57
C = −2.35 ± 0.59
D = +2.63 ± 0.56
E = −2.90 ± 0.69,

structural length being taken as the distance from the first vertex of the first lens to the image plane of the objective; the first part comprising a first member primarily of material of glass Range 1 and having a refractive power proportional to the value A, and a second member of material primarily from glass Range 2 and having a refractive power proportional to the value B; the second part comprising a member primarily of material of glass Range 3 and having a refractive power proportional to the value C; the third part comprising a member primarily of material of glass Range 4 and having a refractive power proportional to the value D; the fourth part comprising a member primarily of material of glass Range 5 and having a refractive power proportional to the value E; the proportionality factor being the reciprocal of the structural length of the objective.

3,883,230

TELEPHOTO LENS OBJECTIVE

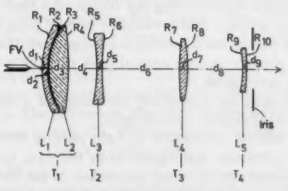
Fritz Determann, Oberkochen, and Heinz Zajadatz, Aalen, both of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Germany

Continuation-in-part of Ser. No. 332,416, Feb. 14, 1973. This application May 3, 1974, Ser. No. 466,915

Claims priority, application Germany, May 5, 1973, 2322813

Int. Cl. G02b 9/00

U.S. Cl. 350—214 **12 Claims**



1. A photographic telephoto lens objective, comprising a converging first part facing the side of the longer light distance, a following diverging second part, a converging third part following at a greater distance away, and a final diverging fourth part, characterized by the fact that the optical materials for all lenses with the exception of associated lenses which are almost free of refractive power are selected from five ranges of the P** - P* presentation, in accordance with which:

$$P^{**} = \frac{N_F - N_i}{N_F - N_C}$$

$$P^{*} = \frac{N_F - N_t}{N_F - N_C}$$

where N is the index of refraction and the subscripts F, C, *i* and *t* represent the wavelengths of light for the blue and red hydrogen lines and for the ultraviolet and infrared mercury lines, respectively, and that for ranges 1 to 5 the following limits apply:

Range 1: $P^{**} = -1.933 \pm 0.021$ $P^{*} = 1.749 \pm 0.010$
Range 2: $P^{**} = -1.724 \pm 0.021$ $P^{*} = 1.787 \pm 0.010$
Range 3: $P^{**} = -1.863 \pm 0.021$ $P^{*} = 1.765 \pm 0.010$
Range 4: $P^{**} = -2.091 \pm 0.021$ $P^{*} = 1.727 \pm 0.010$
Range 5: $P^{**} = -1.925 \pm 0.021$ $P^{*} = 1.751 \pm 0.010$,

that from the optical materials so selected, lens parts comprising lens members or groups of lens members are formed whose refractive powers, multiplied by the structural length assume successive refractive power characteristics A, B, C, D, E, which, for a refractive power 1.0 for the entire system are:

A = −0.74±0.26
B = +3.08±0.57
C = −1.80±1.14
D = +2.63±0.76
E = −3.40±1.20,

structural length being taken as the distance from the first vertex of the first lens to the image plane of the objective; the first part comprising a first member primarily of material of glass range 1 and having a refractive power proportional to the value A, followed by a second member of material primarily from glass range 2 and having a refractive power proportional to the value B; the second part comprising a member primarily of material of glass range 3 and having a refractive power proportional to the value C; the third part comprising a member primarily of material of glass range 4 and having a refractive power proportional to the value D; the fourth part comprising a member primarily of material of glass range 5 and having a refractive power proportional to the value E; the proportionality factor being the reciprocal of the structural length of the objective; said objective being further characterized by relationships between said refractive power characteristics such that:

B+C = 1.34±1.0, and
D+E = −0.80±0.87.

3,883,231

OBJECTIVE LENS SYSTEMS FOR USE IN MICROSCOPES

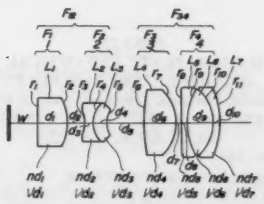
Tsohimichi Koizumi, Tsukui-machi, Kanagawa Pref., Japan, assignor to Olympus Optical Company Limited

Continuation-in-part of Ser. No. 277,821, Aug. 3, 1972, abandoned. This application Nov. 5, 1973, Ser. No. 412,725

Claims priority, application Japan, Aug. 4, 1971, 46-58354

Int. Cl. G02b 9/34

U.S. Cl. 350—220 **5 Claims**


Fa
Fb
F1 F2
F3 F4
L1 L2 L3 L4 L5 L6 L7
r1 r2 r3 r4 r5 r6 r7 r8 r9 r10 r11
W
d1 d2 d3 d4 d5 d6 d7 d8 d9 d10
nd1 nd2 nd3 nd4 nd5 nd6 nd7
νd1 νd2 νd3 νd4 νd5 νd6 νd7

1. An objective lens system for use in microscopes, which is constructed as four lens components and seven lenses, comprising: a first component consisting of a first lens having

a positive refractive power and being made of general optical glass having a high refractive index and a low Abbe's number; a second component having a negative refractive power and being made of general optical glass, consisting of a biconcave second lens cemented to a positive meniscus third lens; said first and said second components constituting a front lens component system having a negative refractive power; a third component consisting of a biconvex fourth lens having a positive refractive power and being made of optical crystal or general optical glass having a high Abbe's number; and a fourth component having a positive refractive power, including a sixth lens having a positive refractive power and being made of optical crystal or general optical glass having a high Abbe's number, held between a fifth and seventh lens, the latter two having a negative refractive power and being made of general optical glass, said fifth lens being a negative lens cemented to said sixth and said seventh lenses, being respectively a biconvex and a negative meniscus lens; said third and said fourth components constituting a rear lens component system having a positive refractive power; and all lenses being arranged in succession from the side of an object, and which is defined by the following conditions:

(1) $nd_1 \geqq 1.73, \nu d_1 \leqq 4.0, 0.8 > \frac{F_1}{F'} > 0.37, \frac{r_1}{F'} \geqq 1;$

(2) $15 \geqq |\nu d_2 - \nu d_3|, \nu d_2 \geqq 50, nd_2 \geqq 1.55,$
$0.25 \geqq \frac{r_4}{F'} \geqq 0.1, 0.25 > \frac{|F_2|}{F'} > 0.14;$

(3) $\nu d_4 \geqq 70, 0.7 > \frac{F_3}{F'} > 0.4;$

(4) $3 \geqq \frac{F_4}{F'} \geqq 1.5, \frac{|r_8|}{F'} \geqq 10, \nu d_6 \geqq 70;$

(5) $0.3 > \frac{d_5}{F'} > 0.12;$ and

(6) $1.5 > \frac{|F_{12}|}{F'} > 0.4, 0.8 > \frac{F_{34}}{F'} > 0.3$

where F' is a focal length of the total lens system, F_1, F_2, F_3 and F_4 are respective focal lengths of said first, said second, said third and said fourth components, F_{12} and F_{34} are respective composite focal lengths of said front and said rear lens component systems, $r_1, r_2, \ldots r_{11}$ are radii of curvatures of the successive lenses counted from the first component, $d_1, d_2, \ldots d_{10}$ are axial thicknesses of or air spaces between the successive lenses, $nd_1, nd_2, \ldots nd_7$ are refractive indexes, and $\nu d_1, \nu d_2, \ldots \nu d_7$ are respective Abbe's numbers of said lenses.

3,883,232

RANDOM PHASE PLATE AND OPTICAL SYSTEM INCORPORATING SAID PLATE

Yoshito Tsunoda, Hachioji, Japan, assignor to Hitachi, Ltd.

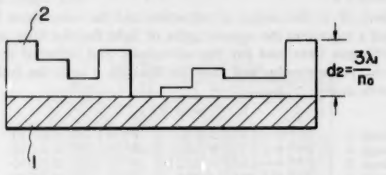
Filed Dec. 3, 1973, Ser. No. 421,350

Int. Cl. G02b *5/18, 5/22*

U.S. Cl. 350—314 **4 Claims**

1. A random phase plate comprising:

a plurality of phase shifting elements disposed adjacent one another in a random arrangement, and having a plurality of different effective optical thicknesses, so as to provide random phase shifts to the respective spectral components of a multi-chromatic light beam incident thereon, and wherein the optical thickness of those elements which have the maximum optical thickness among said



plurality of elements is an integral multiple of each of the spectral components of said multi-chromatic light beam.

3,883,233

AUTOMATIC, RECORDING REFRACTOMETER

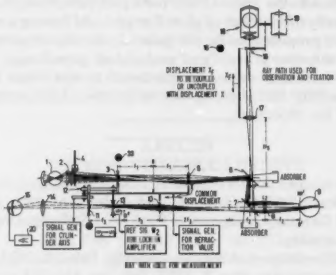
Gunther Guilino, Munich, Germany, assignor to Optische Werke G. Rodenstock

Filed Dec. 21, 1973, Ser. No. 427,114

Claims priority, application Germany, Dec. 22, 1972, 2262886

Int. Cl. A61b *3/10;* **G01b** *9/00*

U.S. Cl. 351—6 **11 Claims**



1. An automatic, recording refractometer for determining visual defects comprising:

first means for directing the image of a first rotatable test figure along a first prescribed optical path into the eye;

second means for directing the image from the retina of the eye along a second optical path through a second rotatable test figure;

third means for projecting the image of a fixation marker into said second optical path;

fourth means, responsive to light passing through said second rotatable test figure from the eye, for providing a measurement of visual anomalies of the eye;

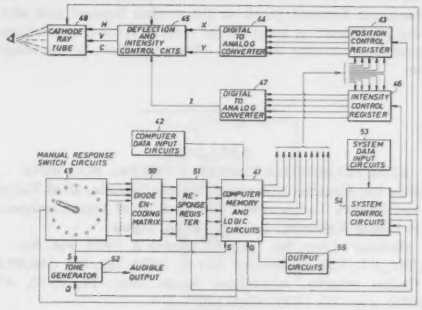
fifth means, coupled to said test figures, for effecting a relative displacement of said test figures in such a way that the image of the first rotatable test figure reflected from the retina of the eye under examination is focused on the second rotatable test figure; and

sixth means for coupling the displacement of said fixation marker in an optional manner with said fifth means.

3,883,234
COMPUTER CONTROLLED APPARATUS FOR AUTOMATIC VISUAL FIELD EXAMINATION

John R. Lynn, 10001 Preston Rd., Dallas, Tex. 75230, and George W. Tate, Jr., 121 C Artillery Post Dr., Houston, Tex. 78234

Division of Ser. No. 54,289, July 13, 1970, Pat. No. 3,705,003. This application Dec. 4, 1972, Ser. No. 311,533
Int. Cl. A61b *3/02*
U.S. Cl. 351—23 **13 Claims**



1. Apparatus for testing the visual field of a subject comprising:

means for presenting under machine control at selected locations on a test field at test point locations selected from a test array momentary, stationary spots of light, each having a stimulus value selected from a group of discrete stimulus values;

subject response means manually operable by the subject for providing an output indicating the sector relative to a fixation point on the test field in which the subject indicates a spot was perceived; and

means, responsive to the output of said subject response device for automatically determining whether the subject correctly perceived a given spot presented on the test field by determining if said given spot was presented within n sectors of the sector indicated by the output of the subject response device, where *n* is an integer;

said means for presenting further including means for presenting at said selected locations additional momentary, stationary spots of light of selected stimulus values until, for each location, a threshold value is detected at each location at which any spot presented correctly perceived or a spot of maximum stimulus value selected from said group is presented at locations at which no spot was correctly perceived.

3,883,235
AUTOMATIC VISUAL FIELD EXAMINATION INCLUDING FIXATION MONITORING COMPENSATION

John R. Lynn, 10001 Preston Rd., Dallas, Tex. 75230, and George W. Tate, Jr., 4323 Brown Apt. 243, Dallas, Tex. 75219

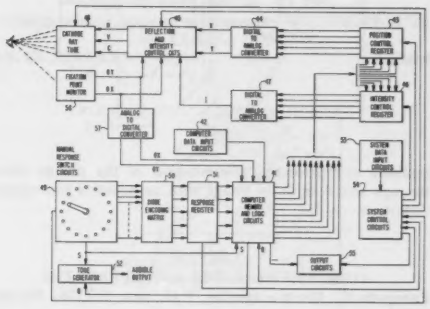
Continuation-in-part of Ser. No. 181,538, Sept. 17, 1971, Pat. No. 3,718,386. This application Feb. 26, 1973, Ser. No. 335,572. The portion of the term of this patent subsequent to Feb. 27, 1990 has been disclaimed.
Int. Cl. A61b *3/02*
U.S. Cl. 351—39 **39 Claims**

1. An automatic machine implemented process for testing the visual field of a subject comprising the steps of:

establishing a test field positioned relative to a predetermined point on a test screen;

determining, under machine control, the instantaneous location of the direction of gaze of the subject relative to the predetermined point;

translating the test field relative to the predetermined point on the test screen when the direction of gaze is not at said predetermined point to reposition the test field relative to the direction of gaze the same as the position of the test field relative to said predetermined point when the test field was initially established;



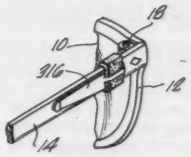
presenting, on the test screen, under machine control, test stimuli of selected stimulus value at preselected locations in the test field; and

determining whether the subject percieved the test stimuli.

3,883,236
CLIP FOR SPECTACLES

Walter J. Zipper, 463 Mesa Rd., Santa Monica, Calif. 90402

Filed Oct. 19, 1973, Ser. No. 408,579
Int. Cl. G02c *5/16*
U.S. Cl. 351—112 **4 Claims**



1. In an arrangement wherein a clip is used for releasably securing conventional spectacles having a temple hinged to a lens frame to a person's clothing such as, for example, his shirt or coat pocket wherein the improvement comprises, a clip of cantilever structure, said clip being an elongated strip member with an elastic element encircling one end portion of said strip, and means on said strip retaining said elastic element on said one end portion, said elastic element being stretchable such that said temple may be inserted between said element and said strip with said elastic element then engaging said temple with sufficient frictional contact to prevent slippage of said clip on said temple and with said elastic element then serving as a hinge element for hinging said strip member on said temple.

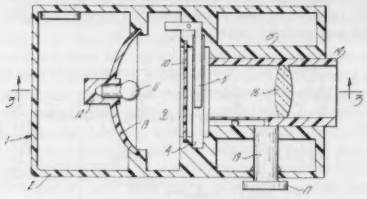
3,883,237
PANORAMIC IMAGE REPRODUCING APPARATUS

Tristan D. Juergens, Milwaukee, Wis., assignor to The Gates Rubber Company, Denver, Colo.

Filed Aug. 3, 1972, Ser. No. 277,623
Int. Cl. G03b *21/00*
U.S. Cl. 353—10 **6 Claims**

1. An apparatus for viewing a three-dimensional effect image of a single-dimensional substantially planar object, comprising an object carrier means, a lens means constructed for creating a pin cushion distorted image, the lens means mounted and spaced relative to said object carrier and having

the axis of the lens means generally perpendicular to the plane of the planar object, and means for illuminating the object to



establish corresponding presentation of the planar object through said lens as an image with appreciable pin cushion distortion.

3,883,238

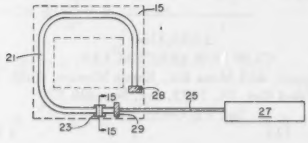
AUDIOVISUAL SLIDES AND APPARATUS

Panayotis C. Dimitracopoulos, P.O. Box N-7776, Nassau, Bahamas

Filed Dec. 26, 1973, Ser. No. 427,590

Int. Cl. G03b *31/06*

U.S. Cl. 353—19 **9 Claims**



1. Means to reproduce and project audiovisual information comprising:

a. support means for fixedly holding an audiovisual record having a projectable image and an information track,

b. optical projection means directed onto said image,

c. rail guiding means facing said track and enantiomorphically following the geometric configuration of said track,

d. a transducer slidably supported by said rail means and cooperable with said track,

e. moving means for moving said transducer along said rail means and thus carrying said transducer progressively along and in an information-scanning relation to said track.

3,883,239

PHOTOGRAPHIC SLIDE-PROJECTORS

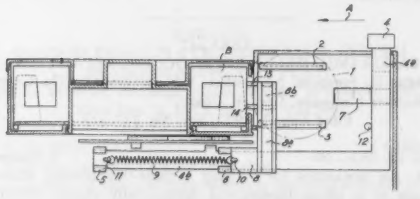
Serge Besancenot, Post of Sevran, Sevran, France

Filed May 11, 1973, Ser. No. 360,379

Claims priority, application France, May 29, 1972, 72.19093

Int. Cl. G03b *23/02*

U.S. Cl. 353—118 **6 Claims**



1. A photographic slide-projector of the type incorporating an optical projection system to which the slides are to be fed by forward travel one by one from a magazine and from which they are to be returned one by one to the magazine comprising a movable pusher, a resilient clip carried by said pusher and including flexible limbs able to grip a slide to be projected when the latter is in the magazine so as to extract the slide therefrom and to feed it in front of the optical projection system, first means on said pusher having an aperture in which said limbs are insertable for closing the resilient clip to grip a slide in the clip in this state during forward travel of the pusher, and removable from said aperture for opening the clip upon arrival of the slide in front of the optical system and subsequent forward travel of the pusher beyond said slide being positioned in front of the optical system, and second means for returning the slide, after projection, to the magazine.

3,883,240

ELECTROPHOTOGRAPHIC COPYING MACHINE

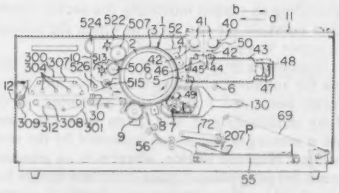
Yoshio Ito; Hamime Katayama; Hiroshi Nitanda, all of Tokyo, and Masaru Yamaguchi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 120,132, March 2, 1971, Pat. No. 3,784,297. This application Apr. 5, 1973, Ser. No. 348,093

Claims priority, application Japan, Mar. 11, 1970, 45-20075; Apr. 15, 1970, 45-32112

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 DD **5 Claims**



1. An electrophotographic copying machine comprising a housing,

an original holder reciprocable upon the upper surface of an electrophotographic photosensitive member unit comprising an electrophotographic photosensitive member disposed substantially at the center of said housing and supporting means for rotatably fixing said member,

charging means disposed on one side of said electrophotographic photosensitive member,

an optical exposure system located to one side of said electrophotographic photosensitive member for effecting an image exposure through a slit,

developing means,

fixing means,

cleaning means,

said fixing and cleaning means being disposed on the other side of said electrophotographic photosensitive member, copy medium feeding means, and

image transfer means, both of which are disposed below said electrophotographic photosensitive member,

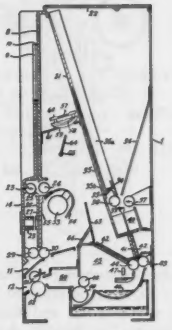
said electrophotographic photosensitive member unit being mounted in said housing so as to be removed upwardly therefrom.

3,883,241

ELECTROPHOTOGRAPHIC COPYING MACHINE AND A BOX-SHAPED MAGAZINE FOR USE IN SUCH A MACHINE

Karl Gustav Zeuthen, Gentofte, Denmark, assignor to Rexomi A/S, Copenhagen, Denmark

Filed May 8, 1973, Ser. No. 358,325
Claims priority, application Denmark, Feb. 10, 1970, 632
Int. Cl. G03g *15/22*
U.S. Cl. 355—3 R 2 Claims



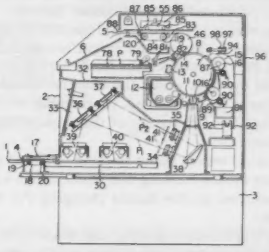
1. A vertical electrophotographic copying machine comprising a vertically extending casing, means in the upper portion of the casing for receiving a stack of copy sheets, means for electrostatically charging a copy sheet having a photosensitive surface, means for feeding said copy sheet and said original from the upper portion of the casing in initially spaced positions in synchronism through the machine to respective ejection openings in the lower portion of said casing, a first substantially vertical transparent member for receiving said original as it passes between the upper portion of said casing and its respective ejection opening, a second transparent member positioned at an acute angle to said first transparent member for receiving said copy sheet as it passes between the upper portion of said casing and its respective ejection opening, an optical system for scanning said original during the movement thereof as it passes said first transparent member and subjecting said copy sheet to exposure as it passes said second transparent member, means to developing the latent electrostatic image on said copy sheet subsequent to exposure, guide means for said original forming a substantially vertical, downwardly directed original travelling path to its ejection opening in the lower portion of said casing, said charging means and said exposing means being likewise arranged along a mainly vertical, downwardly directed copy sheet travelling path, at least one stop member in the path of said original determining the intial position of said original, at least one stop member in the path of said copy sheet, said original and copy sheet being positioned in said original positions by gravity, and means for retracting said stop members from said paths, when the original and the copy sheet, respectively, have been positioned in said initial positions.

3,883,242

ELECTRONIC PHOTOGRAPHIC COPYING MACHINE

Isao Takahashi, Yokohama; Motoharu Fujii, Tokyo; Kazuo Kawakubo, Tokyo; Masao Ariga, Tokyo, and Susumu Sugiura, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 211,276, Dec. 23, 1971. This application July 23, 1973, Ser. No. 381,399
Claims priority, application Japan, Dec. 29, 1970, 45-12721
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 R 1 Claim



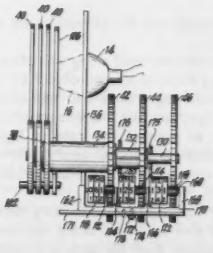
1. An electrophotographic copying machine comprising a repetitively usable electrophotographic photosensitive member; a group of elements including an electrostatic latent image forming means, developing means, transferring means and cleaning means, said elements being disposed sequentially around said photosensitive member, and said developing means and cleaning means being contactable with said photosensitive member; transfer material feeding means; fixing means; a lower main body portion for supporting said photosensitive member, electrostatic latent image forming means, developing means and cleaning means; and an upper main body portion for supporting said transferring means and said fixing means wherein, upon separation of said lower and upper main body portions, said photosensitive member and a path for the transfer material are accessible.

3,883,243

LIGHT COLOR REGULATING APPARATUS

Louis L. Weisglass, New York, N.Y., and Robert A. Flieder, Englewood Cliffs, N.J., assignors to Berkey Photo, Inc., New York, N.Y.

Filed Sept. 25, 1973, Ser. No. 400,646
Int. Cl. G03b *27/76*
U.S. Cl. 355—35 29 Claims



1. A color control apparatus, comprising
a housing;
light source means replaceably mounted in said housing for forming a light beam;
color filter means movable at least partially into the path of the beam for coloring at least a portion of the beam and

leaving the remainder of the beam uncolored when only a portion of the beam is colored;

chamber means in the path of the beam beyond the filter means for mixing the colored portion of the beam with the remainder of the beam so as to produce a light whose color and density vary in response to the color of the filter means and the extent to which the filter means intercepts the beam;

control means coupled to the filter means for moving the filter means into and out of the beam along a continuous path between limits which define the maximum and minimum color densities of the colored light produced by the chamber means so as to control the color density of the color produced by the chamber means;

readout means coupled to said control means for displaying a reading indicating the extent to which filter means has been moved between the limits and hence the color density of the light which the chamber means produces;

said source means being replaceable so as to result in change in the character of the beam relative to said filter means;

said control means being settable to a first position for one source means creating one beam and to a second position for another source means changing the character of the beam;

decoupling means engaging said readout means for decoupling the readout means from said control means to permit matching of a given reading for a predetermined color and density set by the control means and for recoupling said control means and said readout means thereafter.

3,883,244

APERTURE ADJUSTMENT IN OPTICAL ASSEMBLY

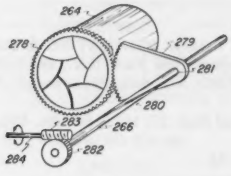
Raymond Whitaker, Leeds, and Bryan S. Haslam, Harrogate, both of England, assignors to Xerox Corporation, Stamford, Conn.

Filed June 19, 1973, Ser. No. 371,457

Claims priority, application United Kingdom, June 23, 1972, 29652/72

Int. Cl. C03b *27/72*

U.S. Cl. 355—71 **2 Claims**



1. Optical apparatus for projecting an image of an object and including:

a lens assembly disposed along an optical axis and movable therealong relative to said object to vary the magnification of said image relative to said object,

a variable aperture iris diaphragm disposed on said lens assembly to control the rate of light exposure therethrough and an external gear operatively connected to said iris diaphragm and rotatable relative to said lens assembly,

a stationary bearing shaft extending parallel to said optical axis, said lens assembly being operatively connected to said stationary shaft for sliding movement therealong,

a biasing shaft extending parallel to said optical axis,

a drive pinion keyed to said biasing shaft for combined rotation and axial movement in a helical locus relative to said biasing shaft, said drive pinion being in operative engagement with said external gear and effective to rotate said external gear when said lens assembly, said gear and said pinion move along said optical axis,

whereby said variable aperture iris diaphragm is adjusted in response to movement of said lens assembly along said optical axis.

3,883,245

MECHANISM FOR STOPPING A CONTACT SCREEN AT A PREDETERMINED POSITION IN A PROCESS CAMERA

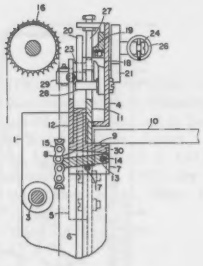
Eiji Miyasaka, 489-1, Takamiya-cho; Kenichi Yonemaru, 480-1, Takamiya-cho, and Kojiro Henmi, 148-2, Hirata-cho, all of Hikone, Japan

Filed Oct. 1, 1973, Ser. No. 402,209

Claims priority, application Japan, Oct. 6, 1972, 47-99793

Int. Cl. G03b *27/66*

U.S. Cl. 355—71 **5 Claims**



1. A mechanismm for stopping a contact screen in a process camera correctly at a predetermined position, comprising sliders arranged movable up and down while carrying a contact screen retainer bar thereon, driving means with play for driving said sliders, a switch to deactuate said driving means and a rocker member and further characterized in that when said sliders are raised up and said rocker member is accordingly pushed up by a part thereof to a point beyond the dead center, said rocker member is turned additionally by a spring, and during this additional turn said rocker member engages a part of said sliders with parts of said sliders to move the latter to their stoppage position.

3,883,246

ELECTRONIC DEVICE ADAPTED TO PRODUCE HIGH VOLTAGE-PULSES, ESPECIALLY FOR IGNITING A GAS LIGHTER

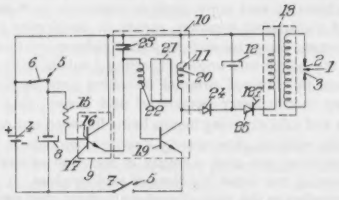
Henri Edouard Francois Marie Courier de Mere, Paris, France, assignor to Bicosa-Societe de Recherches, Clichy (Haut-de-Seine), France

Filed Jan. 22, 1973, Ser. No. 325,891

Claims priority, application France, Jan. 25, 1972, 72.002407; Apr. 12, 1972, 72.012833; July 7, 1972, 72.024714; Dec. 11, 1972, 72.043967

Int. Cl. F23q *2/28*

U.S. Cl. 431—264 **31 Claims**



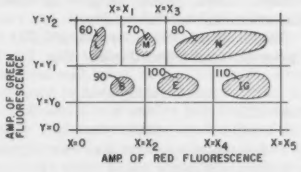
1. An electronic ignition device for igniting fuel in cigarette lighters, gas burners and other fuel-consuming apparatus of the type provided with a burner unit and a spark gap arranged

in proximity to the burner unit, comprising, in combination, a D.C. voltage source; voltage raising means connected to said source and to said spark gap and operative for generating a spark voltage across said spark gap, said voltage raising means including oscillator means connected to said source and operative for converting the D.C. voltage of said source into an oscillating voltage having a maximum voltage value higher than the voltage value of said D.C. voltage; switch means having an activated condition and an unactivated condition, and being operative when activated for initiating operation of said oscillator means to cause said voltage raising means to generate a spark voltage across said spark gap; and terminating means operative when said switch means remains in activated condition for automatically terminating operation of said oscillator means upon elapse of a predetermined time interval following the initiation of operation of said oscillator means.

3,883,247
METHOD FOR FLUORESCENCE ANALYSIS OF WHITE BLOOD CELLS

Lawrence R. Adams, Mahopac, N.Y., assignor to Bio/Physics Systems, Inc., Mahopac, N.Y.

Filed Oct. 30, 1973, Ser. No. 410,994
Int. Cl. G01n *1/30*
U.S. Cl. 356—39 **23 Claims**



22. A method for classifying vital white blood cells amoung the groups of lymphocytes, monocytes, neutrophils, basophils, eosinophils and immature forms of granulocytes, said method comprising the steps of:

a. combining a fresh blood sample with a hypotonic colloidal solution of a metachromatic fluorochrome dye at a physiologically normal pH; and

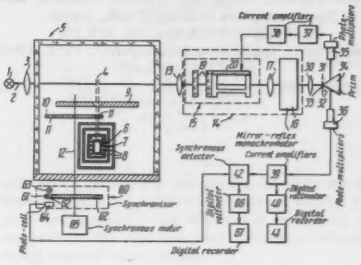
b. distinguishing the groups of white blood cells by measuring the magnitudes of metachromatic fluorescences from the individual cells in response to optical radiation.

3,883,248
METHOD AND APPARATUS FOR MEASURING CONCENTRATION OF SUBSTANCE IN ITS GASEOUS PHASE

Vadim Izrailovich Rakhovsky, ulitsa Mashinostroenia, 2/7, korpus 1, kv. 68; Gennady Izrailovich Stotsky, bulvar generala Karbysheva, 22, kv. 50; Maria Andreevna Mazing, ulitsa Kerchinskaya, 32, kv. 37, all of Moscow, and Valery Mikhailovich Shustryakov, MFTI, korpus 7, kv. 413, Dolgoprudny Moskovskoi Oblasti, all of U.S.S.R.

Filed Aug. 31, 1972, Ser. No. 285,194
Claims priority, application U.S.S.R., June 13, 1972, 1797587; June 13, 1972, 1797588
Int. Cl. G01j *3/42*
U.S. Cl. 356—85 **10 Claims**

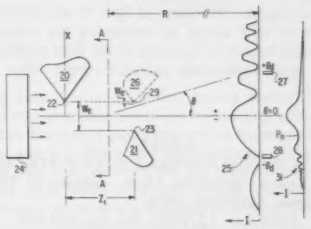
1. A method of measuring the concentration of a substance in its gaseous phase, said method comprising the steps of: continuously passing a luminous flux emitted by a source of light through a target containing the substance being measured in its gaseous phase, the substance being disposed in said target as a periodically interrupted atomic beam; absorbing by said atomic beam a portion of radiation emitted by said luminous flux each time said atomic beam interferes with said flux, thereby generating an alternating component of said luminous flux; passing said luminous flux without absorption; isolating a radiation spectrum section of said source of light including the whole absorption line of the substance involved; converting the luminous flux corresponding to said isolated spectrum section into an electric signal; repeatedly storing the alternating component of the electric signal in synchronism with the interruption of said atomic beam, thereby increasing the portion of useful signal in noise; and determining the ratio of said electric signal to a signal corresponding to the luminous flux passed through said target without being absorbed, proportional to the concentration of the substance being measured in its gaseous phase.



3,883,249
Z-FACTOR AND OTHER DIFFRACTOGRAPHIC DISPLACEMENT AND PROFILE SENSORS

Timothy R. Pryor, P.O. Box 2093, Windsor, Ontario, Canada (N8Y 4R5)

Continuation-in-part of Ser. Nos. 253,421, May 15, 1972, and Ser. No. 256,099, May 23, 1972, Pat. No. 3,797,939, and Ser. No. 329,121, Feb. 2, 1973. This application May 9, 1973, Ser. No. 358,547
Int. Cl. G02b *9/02*
U.S. Cl. 356—109 **39 Claims**



1. A method of determining the relative position of at least two boundaries comprising the steps of:

directing electromagnetic waves onto at least one first boundary to produce a first diffraction wave;

directing electromagnetic waves onto at least one second boundary to produce a second diffraction wave, said second boundary being spaced from said first boundary in the direction of propagation of said electromagnetic waves, said first and second diffraction waves interacting to produce an interference pattern; and

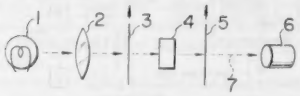
determining from said interference pattern the relative position of said first and second boundaries, in a direction transverse to said direction of propagation, or in said direction of propagation, or in both of said directions.

3,883,250

METHOD OF OPTICALLY MEASURING THE ABSORPTION OF LIGHT HAVING A SPECIFIC WAVELENGTH BY A SAMPLE, BY ADJUSTING THE OUTPUT OF A DETECTOR RESPONSIVE TO LIGHT HAVING WAVELENGTHS LONGER THAN THE SPECIFIC WAVELENGTH TO A ZERO LEVEL

Nobumitsu Unuma, Tokyo, and Yasushi Nomura, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan

Filed July 5, 1973, Ser. No. 376,274
Claims priority, application Japan, July 7, 1972, 47-67507
Int. Cl. G01j *3/48*
U.S. Cl. 356—184 **7 Claims**



1. A method of optically measuring the absorption of light having a specific wavelength by a sample comprising the steps of:

a. directing a beam of light along a prescribed path to light detecting means;

b. inserting into said beam of light a substantially monochromatic filter, said filter effectively transmitting light at substantially said specific wavelength;

c. inserting into said beam of light, optically in series with said monochromatic filter, a selective filter which effectively passes light at wavelengths other than at said specific wavelength, and which effectively blocks light at said specific wavelength;

d. adjusting the output of said light detecting means to a zero level in response to the light passing through both said substantially monochromatic filter and said selective filter;

e. removing said selective filter from said beam of light;

f. inserting into said beam of light, optically in series with said monochromatic filter, a sample which effectively absorbs light having said specific wavelength but effectively transmits light containing wavelengths other than said specific wavelength; and

g. measuring the absorption of light of said specific wavelength by said sample by measuring the output of said detecting means, in response to the light passing through both said substantially monochromatic filter and said sample.

3,883,251

SINGLE PHOTO EPIPOLAR SCAN INSTRUMENT

Uuno V. Helava, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 12, 1974, Ser. No. 460,637
Int. Cl. G01n *21/22*
U.S. Cl. 356—203 **16 Claims**

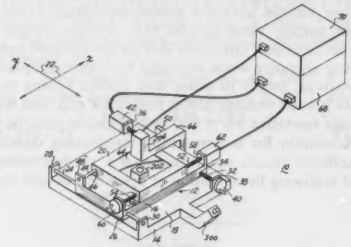
1. A scan instrument for generating image data from a single photographic image along epipolar lines and storing the image data for subsequent data processing and map making comprising:

a rigid base;

stage means attached to said base for providing translatory motion along at least two mutually perpendicular axes relative to said base, said stage means adapted to receive said photographic image and translate said image along said mutually perpendicular axes;

microdensitometer means fixedly attached to said base for detecting the image details within a predetermined area on the photographic image and generating electrical signals indicative of the detected image details;

control means for actuating said stage means to translate said photographic image relative to said densitometer causing said microdensitometer means to generate electrical signals indicative of the image details along a predetermined set of epipolar lines on the photographic image; and



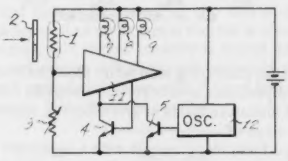
means for storing the electrical signals generated by said microdensitometer means.

3,883,252

EXPOSURE METER DEVICE

Hirokazu Ando, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1973, Ser. No. 392,231
Claims priority, application Japan, Aug. 29, 1972, 47-100836
Int. Cl. G01j *1/42*
U.S. Cl. 356—227 **4 Claims**



1. An exposure meter device for indicating which one of a plurality of exposure ranges has been selected as the one into which an exposure amount has been regulated, which comprises:

a plurality of electrically energizable illuminative elements for displaying a visual indication of the selected exposure range, at least a first one of the elements being exclusively pre-assigned to indicate a pair of exposure ranges that differ slightly and grossly respectively from a normally optimum exposure range, one of the pair being indicated by flickering of the first element, the other of the pair being indicated by continuous illumination of the first element;

photosensitive transducing means for providing an electrical signal indicative of the regulated exposure amount, electrical signal varying relative to a plurality of threshold values that define a plurality of electrical signal ranges each of which corresponds to a different one of the exposure ranges; and

circuit means coupled to receive the electrical signal and responsive to the electrical signal's value relative to the threshold values for selectively energizing the illuminative elements so that they display the visual indication, the circuit means including a first circuit having a plurality of output terminals, each of a first plurality of the output terminals being connected to a different one of the elements, the first circuit operating to connect on a one-at-a-time basis any one of the elements into a current flow

path, and the circuit means further including switching means in the current flow path and controllable by the first circuit either to maintain a steady current flow or to cause pulsating current flow and thereby cause either continuous or flickering illumination of the selected element.

3,883,253

MECHANICAL PENCIL

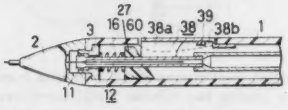
Takeo Naruse, Saitama; Junichi Hashimoto, and Hideaki Oikawa, both of Tokyo, all of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,731

Claims priority, application Japan, Mar. 3, 1972, 47-26301; July 10, 1972, 47-81359; July 10, 1972, 47-81360; Nov. 10, 1972, 47-129536

Int. Cl. B43k *2/16*

U.S. Cl. 401—65 **3 Claims**



1. In a push type mechanical pencil comprising an outer casing; an inner casing having at its fore end a lead gripping chuck means and also formed with a lead passage communicated with said chuck means and a spare leads housing tube communicated with said lead passage; and a spring means adapted to press said inner casing rearwardly along its axis, wherein said push type mechanical pencil further comprises a fore larger hole and a rear smaller hole both formed in alignment through said outer casing and defined by a bridge formed integral with said outer casing, said fore larger hole being formed at a place where a user's fingertip is positioned when the user grasps said outer casing, an elastic push plate adapted to normally lie covering said holes along the external surface of said outer casing, said push plate being bent in L-shape at its rear end portion and tailed in said rear smaller hole such that said push plate is bendable about said bridge, said push plate having side walls suspending from both sides of its fore end portion and extending into the inside of said outer casing, and an engaging member secured to said inner casing at the rear part of said spring and having a tapered surface formed at the rear portion thereof on which the fore edges of said side walls of said push member acts, whereby when the user pushes said push plate downwardly toward the inner casing, the fore edges of said push plate push said engaging member to move forwardly against the resisting force of said spring, thereby pushing out the lead into a writing position.

3,883,254

PORTAL BUSHING FOR PRODUCT CONTAINER

Martin M. Vasas, Fairfield, Conn., assignor to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.

Filed Apr. 5, 1973, Ser. No. 348,104

Int. Cl. A46b *11/00*

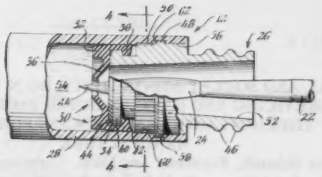
U.S. Cl. 401—122 **10 Claims**

1. A portal bushing for use with a reservoir body in a reservoir assembly to provide access thereinto for an applicator, said bushing comprising:

a generally cylindrical body with a passage therethrough between a first axial end and a second axial end;

means for affixing a seal around the external periphery of said cylindrical body, said affixing means being disposed on said first axial end; and

a lip for interlocking with the reservoir body and means for penetrating into the reservoir body, said lip and said penetrating means being disposed on the external periphery of said cylindrical body between said first axial end and said second axial end, said lip being engageable with a groove in the reservoir body to translate thrust forces therebetween and said penetrating means being engage-



able into a penetrable portion on the reservoir body to translate torsional forces therebetween, said lip and said penetrating means being effective to retain said cylindrical body in the reservoir body with no continual stress being exerted therebetween.

3,883,255

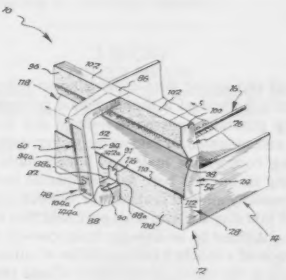
MOLDED PLASTIC FRONT SECTION FOR CARD TRAY AND ASSOCIATED FOLLOWER ROD FRONT END PORTION

Carl H. Little, Jamestown, N.Y., assignor to Weber Knapp Company, Jamestown, N.Y.

Filed Aug. 8, 1973, Ser. No. 386,540

Int. Cl. B42f *13/14*

U.S. Cl. 402—61 **6 Claims**



1. In a card tray construction having separately formed front and tray sections, means for connecting a front of said tray section to a rear of said front section to form a completed card tray, and a follower rod rearwardly insertable through said front and tray sections for the purpose of removably supporting cards within said tray section, the improvement wherein said front section comprises in combination:

a generally rectangular rear panel and a generally rectangular composite front panel assembly joined to said rear panel to form said front section, said panel assembly including a central panel element, an upper panel element and a lower panel element, said central panel element having a horizontally extending central band portion, upper and lower connecting portions arranged to upstand and depend from adjacent a mid point of said band portion and an essentially U-shaped drawer pull end connected to upper and lower extremities of said connecting portions so as to forwardly bridge said band portion, said upper and lower panel elements forwardly overlying said upper and lower connecting portions and cooperating with said band portion to form a forwardly facing surface of said front section and to define an open ended recess extending transversely of said forwardly

facing surface for receiving a tray contents identifying card, and said drawer pull and said lower panel element and said lower connecting portion and said rear panel are formed with substantially aligned openings for permitting passage of said follower rod rearwardly through said front section into an inserted position within said tray section.

3,883,256

BALL AND SOCKET JOINTS WHICH DO NOT REQUIRE SERVICING AND HAVE AN OUTER JACKET OF A THERMOPLASTIC, AND PROCESS FOR THEIR MANUFACTURE

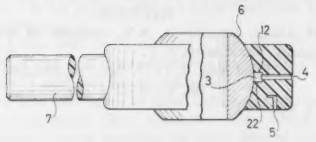
Horst Schmidt, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 27, 1973, Ser. No. 419,190

Claims priority, application Germany, Nov. 29, 1972, 2258355

Int. Cl. F16c *11/06*

U.S. Cl. 403—141 **7 Claims**



7. A ball and socket joint comprising an inner ring and an outer jacket formed of a thermoplastic material, said inner ring being generally spherical in shape and being movably received and mounted in said outer jacket; said outer jacket comprising cooperating male and female parts, said female part having an internal bore formed therein having first and second coaxially aligned sections for respectively receiving a portion of said ring and said male part; said first section of said bore being defined by an annular inner curved surface defining a portion of a sphere having a radius of curvature substantially equal to the radius of curvature of said ring and having its maximum diameter located within said female part; said male part having two opposite sides and an internal bore formed therein for receiving a portion of said ring and an external peripheral surface which is generally complementary to the second section of the bore in said female part; said internal bore of the male part being defined by an inner annular curve defining a portion of a sphere having minimum and maximum diameter portions located respectively on opposite sides of the male part and having a radius of curvature substantially equal to the radius of curvature of said ring whereby said male part may be inserted, in substantially mating engagement, in the second section of the bore of said female part with the side thereof adjacent the maximum diameter of its inner annular curved surface located adjacent the maximum diameter of the inner annular curved surface of the female part to retain said ring therebetween; said male and female parts being secured together by welding in the region of the second bore section of the female part said male and female parts defining an annular groove therebetween adjacent the maximum diameters of their respective inner annular curved surfaces and said female part has a radially extending bore formed therein providing communication between said annular groove and the exterior of the outer jacket through which lubricant may be injected to the ring.

3,883,257

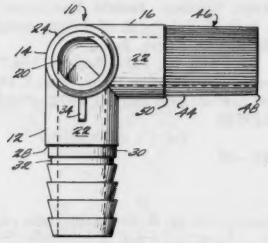
MOLDED JOINT COMPONENT FOR TUBULAR FRAME FURNITURE

Fredrick B. Delafield, Altavista, Va., assignor to The Lane Company, Inc., Altavista, Va.

Filed Nov. 5, 1973, Ser. No. 413,161

Int. Cl. F16b *7/00*

U.S. Cl. 403—172 **1 Claim**



1. A molded joint component for tubular frame furniture such as for joining two tubular metal stretchers which approach one another at an angle in a horizontal plane with a tubular metal leg, said joint component comprising:

an integral tubular molding of acrylonitrile-butadiene-styrene plastic material bearing an exterior bright metallic plating throughout and having the shape of a folded tee wherein two arms of the tee join one another in a horizontal plane and a leg depends from their juncture, the bores of the arms and leg intersecting and intercommunicating at said juncture;

each arm and said leg having a smooth portion at said juncture and leading toward the three respective free ends;

each arm and said leg having a serrated portion axially outwardly of the smooth portion thereof, near the three respective free ends;

means defining an axially outwardly facing, circumferentially extending radial shoulder on each arm and said leg bordering the axially outer extent of the three respective smooth portions;

the serrations and shoulders being disposed to permit the respective arms and leg to be forced into the bores of tubular frame elements to be joined to the extent where the elements abut the respective sholders and are interiorly gripped by the respective serrations;

the serrations on said leg being constituted by a plurality of angularly spaced, longitudinally extending flutes which collectively extend from the free end of the leg to the shoulder and gradually increase in outer diameter from the free end to the shoulder;

the collective outer diameter of the flutes at the shoulder on said leg being smaller than the outer diameter of said shoulder and the arms meeting one another at a right angle and the integral tubular molding further including a horizontal flange extending between the arms at their juncture, whereby a shelf may be supported upon incorporation of the joint component with like others and tubular metal stretchers and legs to constitute tubular frame furniture.

3,883,258

PLASTIC DOWEL PIN AND WOOD JOINT ASSEMBLY

Kenneth E. Hewson, 626 Colony Dr., Troy, Mich. 48084

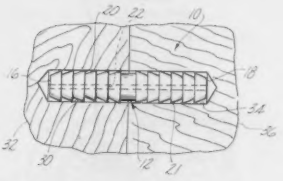
Filed May 24, 1973, Ser. No. 363,349

Int. Cl. F16b *13/00*

U.S. Cl. 403—298 **2 Claims**

1. A dowel pin for connecting two members, each having aligned dowel holes, said dowel pin comprising an elongated body fabricated from a resilient material, the opposite ends of said dowel body being insertable into said dowel holes to join

said members together, said body having a plurality of end-to-end longitudinally aligned truncated cone sections extending from the mid-section of said body to the opposite ends of said body, the larger circular bases of each truncated cone section at the opposite ends of said body having outer diameters that are substantially equal to the dowel holes within which said dowel pin ends are insertable, each larger circular base of each successively inwardly spaced truncated cone section from said end circular bases having outer diameters that are each successively greater than the diameters of said first mentioned larger circular bases by predetermined amounts; the conical surface of each of said truncated cone sections being inclined toward the ends of said body; said mid-section of said



dowel body being of a uniform cylindrical shape, the opposite flat ends of which carry the largest diametered circular bases of the inwardly most aligned truncated cone sections, said mid-section having an outer diameter which is less than the diameter of either of said last mentioned truncated cone section circular bases; a longitudinal slot extending the full longitudinal length of said dowel pin thru the opposite ends of said dowel pin, said body being fabricated from a resilient material, such that said dowel pin peripheral surface adjacent said slot is inwardly compressed as said dowel pin is inserted within said dowel holes, said dowel body exerting an outward force on the larger circular bases of each of said truncated cone sections to lockingly engage said cone sections with the walls of said dowel holes.

3,883,259

SCREEDING BEAM FOR CONCRETE

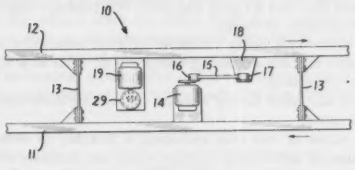
Sture Berg, Solna, and Torsten Fors, Spanga, both of Sweden, assignors to Dynapac Maskin AB

Filed Dec. 6, 1973, Ser. No. 422,307

Claims priority, application Sweden, Dec. 13, 1972, 16244/72

Int. Cl. E04g *21/10*

U.S. Cl. 404—120 **5 Claims**



1. A screeding beam for compacting concrete or similar plastic masses which comprises:

a. two parallel, coplanar beams connected by a flexible assembly comprising leaf springs; and

b. a motor mounted on one of said beams, the shaft of said motor having an eccentrically mounted connecting rod attached to the other of said beams adapted to cause said beams to describe an oscillatory motion relative to one another.

3,883,260

VIBRATION PLATE SYSTEM

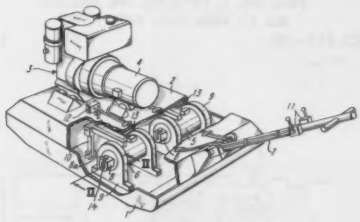
Helmut Heckner, Munich, Germany, assignor to Wacker Werke KG, Munich, Germany

Filed Apr. 29, 1974, Ser. No. 465,256

Claims priority, application Germany, Apr. 30, 1973, 2321761

Int. Cl. E01c *19/30*

U.S. Cl. 404—133 **6 Claims**



1. A vibration plate system which includes: a vibration plate, a surload, cushioning means interposed between said vibration plate and said surload and resting the latter on said vibration plate, said surload comprising an internal combustion engine and an electric generator means drivingly connected to said engine to be driven thereby, electric motor means adapted to be supplied with electric energy from said generator means and including rotor means with rotor shaft means, and means eccentrically supporting said rotor shaft means and together said electric motor means forming unbalance generator means operatively connected to said vibration plate for imparting an unbalance thereon.

3,883,261

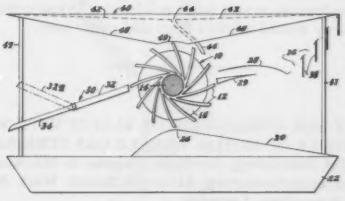
POWER MEANS

Paul E. Saxmann, 6120 E. 21st St., Indianapolis, Ind. 46218

Filed Aug. 13, 1973, Ser. No. 387,686

Int. Cl. F03d *11/04*

U.S. Cl. 415—7 **4 Claims**



1. Power means for obtaining useful power from moving fluid such as water waves or air motion, comprising:

an impeller body member;

means supporting said impeller body member for rotational motion about a horizontal axis; and

baffle means for guiding the moving fluid to operatively impinge against the impeller body member to impart torque thereto in a certain rotational direction;

in a combination with two vertically-spaced baffles on the side of the impeller body member from which the moving water comes, the upper one having means serving to confine the water so as to operatively impinge against the impeller body member only along the lower portion thereof which produces rotational torque in the said certain rotational direction, and the lower one having means serving to confine the water thus deflected by the upper one to cause it to continue to move to operatively impinge against the impeller body member in a torque-

producing manner in contrast to merely dropping vertically and in effect losing some of its kinetic energy.

3,883,262

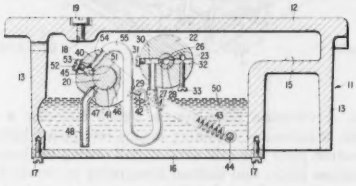
LUBRICANT PUMP FOR SEWING MACHINES

Ulrich Schmedtkord; Roland Franz Saile, both of Karlsruhe, and Reinhold Papajewski, Buchig, all of Germany, assignors to The Singer Company, New York, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,515

Int. Cl. F03b *5/00;* **D05b** *71/00*

U.S. Cl. 415—90 **1 Claim**



1. A lubricant pump for a sewing machine including a rotary actuating shaft with a smooth cylindrical exterior portion, said pump comprising a shaft collar formed with a plain cylindrical bore accommodated with clearance on said smooth cylindrical exterior portion of said rotary actuating shaft, spring means biasing said collar in one direction transversely of said actuating shaft to define a line of closest convergence of said collar bore with said rotating shaft exterior, a lubricant outlet port formed in said collar leading from said line of closest convergence of said collar bore with said smooth cylindrical exterior portion of said rotating shaft exterior, and a lubricant inlet port formed on said collar and leading to said collar bore in angularly spaced relation from said outlet port.

3,883,263

DEVICE FOR COOLING ROTOR BLADES WITH SOLID PROFILE OF MOTOR VEHICLE GAS TURBINES

Horst Mai, Nuremberg, Germany, assignor to Maschinenfabrik Ausburg-Nuremberg Aktiengesellschaft Werk Nuremberg, Nuremberg, Germany

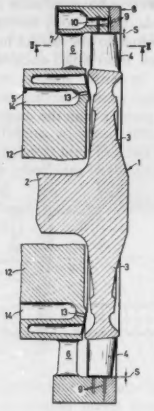
Filed Dec. 20, 1973, Ser. No. 426,911

Claims priority, application Germany, Dec. 21, 1972, 2262597

Int. Cl. F01d *25/08*

U.S. Cl. 415—116 **2 Claims**

1. In combination with a gas turbine rotor of a motor vehicle having a hub and twisted peripheral rotor blades with solid profile, a guide wheel coaxially arranged with said rotor and including: a central section extending around said hub, a peripheral section extending around said rotor blades, and guide blades interconnecting said central section and said peripheral section, annular chamber means radially inwardly of said guide wheel blades and provided with first nozzle means directed and open toward that portion of said turbine rotor which is near to and radially inwardly of said peripheral rotor blades, said annular chamber means being adapted to be connected to a source of cooling air, and second nozzle means provided in said peripheral section and directed at least approximately radially toward the peripheral portion of said peripheral rotor blades, said second nozzle means being



adapted to be connected to a source of compressed cooling air.

3,883,264

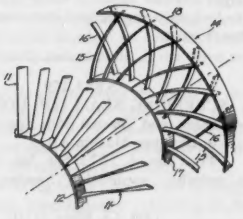
QUIET FAN WITH NON-RADIAL ELEMENTS

Gadicherla V. R. Rao, 450 San Antonio Rd., Woodland Hills, Calif. 94306

Filed Apr. 8, 1971, Ser. No. 132,336

Int. Cl. F01d *5/16, 9/02*

U.S. Cl. 415—119 **3 Claims**



1. In an axial flow apparatus of the type described, in combination:

a rotor unit and a stator unit each comprising a circumferential array of vanes;

said rotor unit being rotatable in axial adjacency to said stator unit for imparting energy to an axial flow through the apparatus;

one of said units having a frame comprising inner and outer supports;

said vanes of one unit including a plurality of non-radial vanes of airfoil cross-section which are similarly oriented in non-radial positions leaning circumferentially away from the radial in a common direction throughout their radial extent; said vanes being secured between said supports;

the vanes of the other unit being oriented in positions angularly related to the positions of said non-radial vanes;

said non-radial vanes comprising a first circumferential array of vanes all similarly oriented in positions leaning circumferentially away from the radial in one direction and a second circumferential array of vanes leaning away from the radial in an opposite direction;

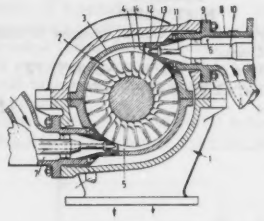
whereby the pulsations created by the vanes of said rotor unit passing the vanes of said stator unit will be attenuated by the radial progressions of the crossings of the relatively moving vanes, thereby reducing noise.

3,883,265

TURBINE

Jan Schrieken, Delden, Netherlands, assignor to Koninklijke Machinefabriek Stork B.V., Hengelo, Netherlands

Filed Sept. 12, 1973, Ser. No. 396,998
Int. Cl. F01b 25/02
U.S. Cl. 415—147 9 Claims



1. A turbine for a compressible medium having at least a first stage wheel which is traversed in the centripetal direction by the driving medium and operates in accordance with the equal pressure principle, said stage being at least partially surrounded by a distribution duct of decreasing cross section, a regulating valve controlling flow into said distribution duct and at which an enthalpy difference of the medium is converted into velocity, said valve comprising a housing provided with a valve body and having a passage which first converges and then diverges and characterised in that in the direction of flow the passage of the valve housing first converges abruptly and then gradually diverges and in that the valve body leaves free, in the closed state, a narrow gap at the area of the smallest section of the housing and extends into the diverging part of the housing by a portion whose sectional area gradually decreases in accordance with a linear function of the place of said section on the longitudinal axis of the valve body and in that in the closed state the valve body is in contact on the upstream side of the converging part with the housing along a common tangential plane which is at an angle to the direction of movement of the valve body, which angle exceeds the friction angle between the valve body and the housing.

3,883,266

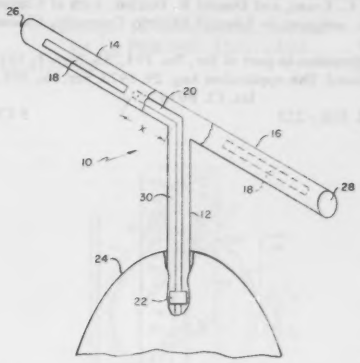
DIFFERENTIAL LIFT CONTROL BY SYNCHRONOUS RESONANT EXCITATION OF AIR COLUMN IN HELICOPTER ROTOR

Herman A. Soulant, Jr., 501 Gilscot Pl., Rockville, Md. 20851

Filed Sept. 24, 1973, Ser. No. 400,107
Int. Cl. B64c 27/72
U.S. Cl. 416—1 1 Claim

1. In a circulation control rotor having hollow blades attached to a hub rotated by some external means, the method of producing cyclic lift which comprises:

matching the rotational speed of the rotor with the natural frequency of vibration of the fluid column in the blades; and



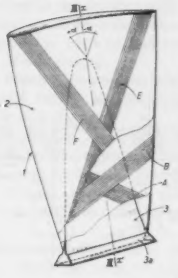
injecting pulses of fluid into the blades at a constant azimuthal position of the rotor.

3,883,267

BLADES MADE OF COMPOSITE FIBROUS MATERIAL, FOR FLUID DYNAMIC MACHINES

Claude Paul Baudier, Antony; Jean Georges Bouiller, Brunoy; Pierre Michel Teysseyre, Paris, and Claude Zabukovec, Brunoy, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Aug. 6, 1973, Ser. No. 385,712
Claims priority, application France, Aug. 4, 1972, 72.28342
Int. Cl. F01d 5/14
U.S. Cl. 416—230 5 Claims

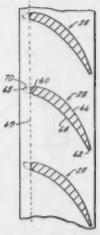


1. In a blade for a fluid dynamic machine, said blade comprising an airfoil section having a root-to-tip centroidal axis and constituted by the superimposition, upon a metal core, of a plurality of superimposed layers of composite fibrous material, and a root section constituted by a metal portion integral with and projecting from said metal core beyond said airfoil section, the improvement wherein said layers of composite fibrous material are arranged each with an orientation such that the angle α made between the general direction of the fibers in a layer and said axis of the blade, diminishes, in absolute value, from a maximum value for the innermost layer or layers which are next to the core, to a minimum value for the outermost layer or layers which are next to the surface of the airfoil section.

3,883,268
BLUNTED LEADING EDGE FAN BLADE FOR NOISE REDUCTION

Robert C. Evans, and Donald K. Dunbar, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 194,285, Nov. 1, 1971, abandoned. This application Aug. 29, 1973, Ser. No. 392,508
Int. Cl. F01d *5/14*
U.S. Cl. 416—223 **5 Claims**



1. In a gas turbine engine of the type which includes rotating turbomachinery, a combustion section, and an exhaust nozzle adapted to provide a propulsive force, the improvement comprising:

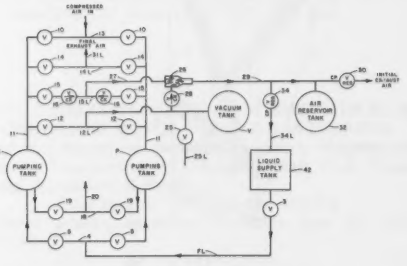
a rotatable disc; and

a plurality of turbomachinery rotor blades carried by said disc and having leading edges at least a portion of which include blunting means for reducing the noise generated by the rotation of said blade, and wherein said leading edges of said blades are generally coplanar.

3,883,269
LIQUID TRANSFER SYSTEM

Robert C. Wolff, 955 Crystal St., New Orleans, La. 70124

Filed Nov. 1, 1973, Ser. No. 411,848
Int. Cl. F04f *1/06*; **B63b** *27/00*; **F16k** *15/00*
U.S. Cl. 417—122 **15 Claims**



1. A transfer system for pumping material in the form of a liquid, slurry or the like comprising:

at least two pumping chambers;

a material supply tank containing the material to be transferred;

a common discharge line for said pumping chambers;

material inlet means connected between said supply tank and said pumping chambers for alternately filling said pumping chambers with the material to be transferred;

material outlet means connected between said pumping chambers and said common discharge line for alternately transferring the material from said pumping chambers to said common discharge line;

fluid pressure head means connected to said pumping chambers for supplying a pumping fluid pressure head to said pumping chambers for forcing the material out of said pumping chambers;

fluid exhaust line means connected to said pumping chambers for exhausting the pumping fluid pressure head from the pumping chambers after the material has been forced out of them;

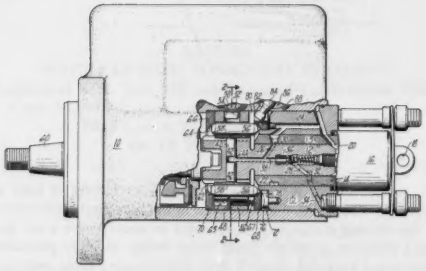
control means connected to said pumping chambers for controlling said inlet means, said outlet means, said fluid pressure head means and said fluid exhaust line means in proper sequence; and

supply tank fluid line means connected between said exhaust line means and the material supply tank for increasing the static pressure head in said material supply tank; whereby the rate of flow of the material to said pumping chambers is increased and complete emptying of the material supply tank is enhanced.

3,883,270
FUEL PUMP

Leonard N. Baxter, Windsor, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Mar. 22, 1974, Ser. No. 453,572
Int. Cl. F04b *49/00*, *17/02*
U.S. Cl. 417—214 **11 Claims**



1. In a fuel pump for an internal combustion engine with a housing having inlet and outlet passages, a fuel distributing rotor journaled in a bore in the housing and having an inlet port and an outlet port which communicate alternately with said inlet and outlet passages during the rotation of said rotor to permit alternate admission and discharge of fuel, plungers slidably mounted in radial passages of said rotor to sequentially pressurize charges of fuel for delivery through said outlet passages, a cam ring surrounding said rotor in the plane of revolution of said plungers and having an inwardly directed contour formed by cam lobes, roller shoes engagable with the ends of said plungers mounting rollers which act as cam followers for translating the cam contour into reciprocable movement of the plungers, and positive mechanical means for regulating the quantity of fuel to be injected per pumping stroke, the improvement wherein said regulating means comprises a pair of cone rings having generally conical inner surfaces engagable with each end of the rollers and means for moving said cone rings axially relatively to each other for adjusting the outward movement of the rollers.

3,883,271
PORTABLE EXHAUST FUMES EXPELLER DEVICE

Kenneth J. Mertes, 1831 4th St. South, Wisconsin Rapids, Wis. 54494

Filed Jan. 21, 1974, Ser. No. 434,969
Int. Cl. F04b *21/00*
U.S. Cl. 417—234 **3 Claims**

1. A portable exhaust fumes expeller device adapted for use with one or more vehicles having their engines running in an

enclosed shop and the like for discharging the exhaust gases from such vehicles to a desired location exteriorly of the shop, the device comprising:

a housing having an air tight chamber defined therein and including an intake aperture and an outlet aperture associated with said chamber;

a centrifugal squirrel cage blower fan disposed in said chamber and operable in a manner to draw air into the chamber through said inlet aperture and discharge said air from said chamber out of said outlet aperture;

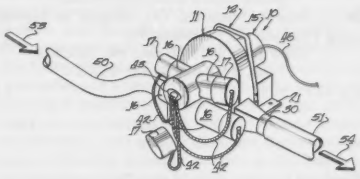
an electric motor mounted on said housing and having a shaft extending outwardly therefrom through a suitable opening in said housing to be connected axially of said blower fan to effect the rotation of said fan about its axis in said chamber;

means adapted to provide electrical energy to said electric motor for effecting the energization thereof;

an elongated hollow cylindrical tubing having one end affixed in an air tight manner to said housing inlet aperture with said tubing extending outwardly therefrom said terminating in a closed end spaced therefrom;

a plurality of longitudinally extending open ended hollow pipes spaced angularly about the circumference of said cylindrical tubing and projecting outwardly therefrom, each pipe having one end affixed in an air tight manner to said tubing with the opposite end defining an intake port opening;

a plurality of elongated cylindrical hollow cap members having a closed end and an open end and adapted to be



axially aligned with an associated one of said pipes and inserted snugly thereover in a telescopic manner to seal the intake port end of said pipe, a cap being provided for each of said pipes;

a plurality of flexible means each having one end affixed to a hook member on said housing with the opposite end of each flexible member affixed to the closed end of an associated cap;

a longitudinally extending open ended hollow discharge tubing having one end affixed to said housing outlet aperture with the opposite end extending outwardly therefrom;

a handle member affixed to said housing and adapted for use in the transporting of the device between locations; and

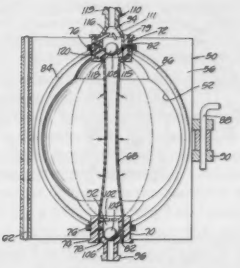
a plurality of longitudinally elongated flexible tubings each adapted to have one end affixed to a tail pipe of a vehicle with the opposite end affixed to one of said intake ports of said pipes with at least one flexible tubing having one end affixed to said discharge end of said discharge tube with the opposite end extending outwardly of the shop to a location exteriorly of the shop whereby operation of the fan creates a partial vacuum in the chamber which is transmitted through the interconnected cylindrical members and pipe members and flexible tubings to the vehicle tail pipe for the drawing of exhaust fumes from a running engine of the vehicle through the device to discharge the same through the discharge tubing and discharge hosing to a safe location exteriorly of the shop.

3,883,272

HYDRAULIC PUMP WITH REPLACEABLE PUMPING MEMBER

Beajamin V. Puckett, 13529 Charlwood Cir., Cerritos, Calif. 90701

Filed Apr. 16, 1973, Ser. No. 351,461
Int. Cl. F04b *9/08, 35/02, 43/08*
U.S. Cl. 417—383 **5 Claims**



1. A pumping device comprising:

a fluid casing having opposite end walls, each of said end walls having means defining openings extending therethrough;

said fluid casing comprising a pair of casing members detachably connected to one another;

each of said casing members having an inner wall, and means defining a cavity in said inner wall of each of said casing members;

said cavities in said inner walls of said casing members cooperating with one another, when said casing members are connected to one another with their inner walls facing one another, to define a fluid chamber in said casing;

a fitting disposed in each of said openings in each of said end walls of said casing;

a generally tubular, impervious elastic member disposed between said fittings and extending through said fluid chamber in said casing;

said generally tubular, impervious elastic member having end portions connected to said fittings and being in sealing engagement therewith, thereby the interior of said generally tubular, impervious elastic member is fluid-isolated from the fluid chamber surrounding the elastic member;

said generally tubular, impervious elastic member and said fittings to which the ends of said elastic member are sealingly connected defining a disposable unit which may be selectively inserted in place in said casing or removed from said casing when said casing members are disconnected from one another;

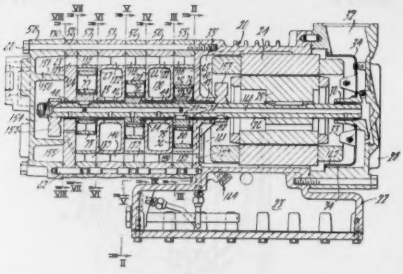
means connecting the interior of said fluid chamber to means creating alternately positive and negative pressure in said fluid chamber to intermittently expand said generally tubular, impevious elastic member in said fluid chamber; and

valve means disposed in each of said fittings to permit a fluid-to-be-pumped to enter one end wall of said casing and into said generally tubular, impervious elastic member when said elastic member is expanded and to permit such fluid-to-be pumped to be discharged through the other end wall of said casing when said elastic member returns to its original, non-expanded condition.

3,883,273
ROTARY CHAMBER-TYPE COMPRESSOR

Robert W. King, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Continuation-in-part of Ser. No. 193,651, Oct. 29, 1971, abandoned. This application Oct. 18, 1972, Ser. No. 298,196
Int. Cl. F04b *17/00;* **F04c** *23/00*
U.S. Cl. 417—410 **29 Claims**



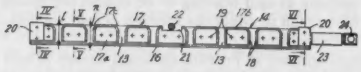
1. In a rotating chamber-type pumping device including a body structure having a cavity therein and having an end wall, a rotor in the cavity having a compound movement which is the resultant of two circular components of rotation about parallel axes at different angular velocities whereby rotating chambers of changing volume are created in areas of the cavity lying radially outside the peripheral wall of the rotor, a fluid inlet orifice in the end wall communicating with a suction chamber-defining area of the cavity outside the peripheral wall of the rotor, an outlet port in the body structure communicating with the exterior and with a compression chamber-defining area of the cavity, a check-type outlet valve controlling flow through said outlet port, a shaft for driving said rotor, said end wall extending radially outwardly a substantial distance beyond said orifice, a second pumping device located on the opposite side of the body from said end wall and also drivable by said shaft; the improvement comprising the rotor being hollow and said inlet orifice extending through said end wall within the peripheral path of and discharging into the interior of the rotor of the first-mentioned pumping device, an additional inlet orifice extending through said body structure radially outwardly of said cavity, a chambered divider member between the first and second pumping devices having passage portions therein communicating with said additional inlet orifice and with said second pumping device to supply fluid to the latter, and a transfer port in said divider member segregated from said passage portions and openings into the cavity of said first mentioned pumping device at positions both inwardly and outwardly of the peripheral wall of the rotor, on the side of the rotor opposite said end wall, to transfer fluid from the hollow interior of the rotor to a suction area of the cavity outside the periphery of the rotor.

3,883,274
CONTROL RODS FOR THE FLOW PER STROKE OF PISTON MACHINES, ESPECIALLY INJECTION PUMPS, AND IN THESE MACHINES THEMSELVES

André Vuaille, 5, rue Cyrano, 69-Lyon (3eme), France

Continuation of Ser. No. 197,688, Nov. 11, 1971, abandoned. This application Jan. 2, 1974, Ser. No. 429,821
Int. Cl. F04b *7/04;* **F04s** *39/10*
U.S. Cl. 417—494 **7 Claims**

1. A control rod for a fuel injection pump adapted to control the quantity of fuel delivered per stroke of the pump, said pump having at least one coaxial piston and cylinder, fuel delivery control means associated with said piston regulated by the angular positioning of the piston relative to said cylinder with respect to their common axis, two slides arranged at each end of the rod, said rod being an elongate member adapted to longitudinally slide in said slides, at least one finger fixed to said piston so as to be rotatable therewith and having a free end controlling said relative angular position, said rod member including a profiled element of L-shaped cross-section having a wide wing and a narrow wing, said wide wing being parallel to the axis of the cylinder and said narrow wing extending towards said cylinder, a plurality of separating members which are approximately U-shaped fixed on said profiled element in the hollow of said L-shaped element the separating members being spaced from one another in the

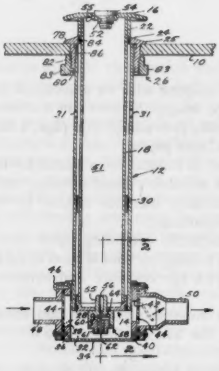


direction of the length of said element said separating members defining as many recesses therebetween as there are fingers, each recess receiving the free end of one finger, the free end of each said finger having a width substantially equal to the width of the recess in which it is positioned, said separating members being formed by walls at right angles to the longitudinal direction of said rod, each U-shaped member having its open end facing the narrow wing of the L-shaped element, the dimension of each U-shaped member perpendicular to the wide wing being substantially equal to the dimension of the narrow wing perpendicular to the wide wing.

3,883,275
MODULAR PUMP ASSEMBLY

Ronald O. Browne, Staunton, Va., assignor to Browne Engineering Corporation, Staunton, Va.

Filed June 5, 1972, Ser. No. 259,602
Int. Cl. F04b *23/02, 41/02*
U.S. Cl. 417—503 **9 Claims**



1. A pump device assembled from modular components which can be fitted together in various ways to form a preferred configuration and capacity for a pump, comprising:

a first tubular component for receving and carrying a reciprocating piston member therein;

a second tubular component, secured to said first tubular component wherein a terminal end of said first tubular component is inserted into an opening formed through a wall of said second tubular component so as to secure the first tubular component in a position which extends into one-half of the diameter of the second tubular compo-

nent, and at a right angle thereto, to provide a secure and strong assembly of the components;

a pumping chamber disposed between said inserted first and second tubular components, said pumping chamber being defined by the intersecting relationship of said first and second tubular components;

an inlet opening communicating with said pumping chamber for being connected to a source of supply of liquid to be pumped;

an outlet opening communicating with said pumping chamber for being connected to a conduit or other discharge area for the liquid being pumped;

a first one-way valve means positioned across said inlet opening to prevent a back flow of liquid from said pumping chamber through said inlet opening;

a second one-way valve means positioned across said outlet opening to prevent a back flow of liquid from said conduit or other discharge area into said pumping chamber, said second one-way valve means being identical to said first one-way valve means so that the two one-way valve means can be used interchangeably;

a piston member fitted within a bore of said first tubular component for being manually reciprocated in said bore to thereby (a) draw a volume of liquid through said first one-way valve means into said pumping chamber and into a portion of the bore of said first tubular component when the piston member is drawn in a direction away from said pumping chamber and (b) push said volume of liquid through said second one-way valve means when the piston member is pushed in a direction towards said pumping chamber; and

a mounting ring assembly carried by said first tubular component to secure the pump device to a deck or bulkhead structure, said mounting ring assembly including:

a first annular ring having a larger diameter flange portion for fixing the axial position of the pump device against one surface of a deck or bulkhead and a smaller diameter sleeve portion connected to the flange portion for being inserted through an opening formed in said deck or bulkhead, said smaller diameter sleeve portion having a threaded external surface at its end which is remote from the flange portion and said smaller diameter sleeve portion being secured by threaded engagement to the threaded surface of the upper end of said first tubular component; and

a second annular ring having an internally threaded surface of a diameter which will allow a threaded engagement of the second annular ring with said first annular ring, said annular ring being of a sufficient size to function as a locking ring which bears against a surface which is opposed to the said one surface of said deck or bulkhead to thereby permit a securement of the pump device through the deck or bulkhead.

2. A manually operated pump device which can be used for pumping a first liquid from a source to a point of use and which further functions to meter a second liquid into the first liquid as it is being pumped, comprising:

a first tubular component for receiving and carrying a reciprocating piston member therein;

a second tubular component secured to said first tubular component wherein a terminal end of said first tubular component is inserted into an opening formed through a wall of said second tubular component so as to secure the first tubular component in a position which extends into one-half of the diameter of the second tubular component, and at a right angle thereto, to provide a secure and strong assembly of the components;

a pumping chamber disposed between said inserted first and second tubular components said pumping chamber being defined by the intersecting relationship of said first and second tubular components;

an inlet opening communicating with said pumping chamber for being connected to a source of supply of a first liquid to be pumped;

an outlet opening communicating with said pumping chamber for being connected to a conduit or other discharge area for the liquid being pumped;

a first one-way valve means positioned across said inlet opening to prevent a back flow of liquid from said pumping chamber through said inlet opening;

a second one-way valve means positioned across said outlet opening to prevent a back flow of liquid from said conduit or other discharge area into said pumping chamber;

a piston member fitted within a bore of said first tubular component for being manually reciprocated in said bore to thereby (a) draw a volume of said first liquid through said first one-way valve means into said pumping chamber and into a portion of the bore of said first tubular component when the piston member is drawn in a direction away from said pumping chamber and (b) push said volume of liquid through said second one-way valve means when the piston member is pushed in a direction towards said pumping chamber;

a separate reservoir means for carrying a supply of a second liquid to be dispensed into said first liquid which is being pumped, said reservoir means having an outlet aperture communicating with said pumping chamber for dispensing said second liquid from the reservoir means into the first liquid being pumped through said pumping chamber; a metering valve means for opening and closing said outlet aperture in response to a change in pressure differential which develops between said reservoir means and said pumping chamber as a result of the pumping of said first liquid into and out of said pumping chamber; and

a mounting ring assembly carried by said first tubular component to secure the pump device to a deck or bulkhead structure, said mounting ring assembly including:

a first annular ring having a larger diameter flange portion for fixing the axial position of the pump device against one surface of a deck or bulkhead and a smaller diameter sleeve portion connected to the flange portion for being inserted through an opening formed in said deck or bulkhead, said smaller diameter sleeve portion having a threaded external surface at its end which is remote from the flange portion, said smaller diameter sleeve portion being secured by threaded engagement to the theaded surface of the upper end of said first tubular component; and

a second annular ring having an internally threaded surface of a diameter which will allow a threaded engagement of the second annular ring with said first annular ring, said second annular ring being of a sufficient size to function as a locking ring which bears against a surface which is opposed to the said one surface of said deck or bulkhead to thereby permit a securement of the pump device through the deck or bulkhead.

3,883,276

DISCHARGE ARRANGEMENT FOR THE EXHAUST GAS FROM THE WORK AREAS OF A ROTARY PISTON COMBUSTION ENGINE

Peter Hofbauer, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

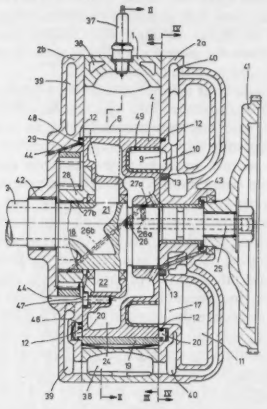
Continuation of Ser. No. 299,594, Oct. 20, 1972, abandoned. This application May 9, 1974, Ser. No. 468,234

Int. Cl. F01c *1/02, 21/04*; **F02b** *55/16*

U.S. Cl. 418—61 B **6 Claims**

1. A combustion engine of the circularly rotating piston type having an internally placed axle comprising a housing having at least a pair of side members and a central member placed between said side members, an eccentric shaft means, a piston means mounted for rotation on said eccentric shaft means with bearing points therebetween, said piston means having a front surface including exhaust gas openings that are in opposition to one of said side members and outlet channels that have a substantially uniform cross-section and are in fluid communication with said exhaust gas openings, said piston

means being further defined by a profile including 2 N lobes defined by an epitrochoid curve, said central member comprising an inner profile having 2 N + 1 counter lobes forming an outer envelope curve for said piston means, gas outlet control opening means provided in the circumferential surface of N lobes of said piston means and in fluid communication with said outlet channels in said piston means, an annular exhaust gas guide means provided in one of said side members and cooperating with said outlet channels, said gas outlet control opening means and said exhaust gas openings in said piston means for leading away said exhaust gas from said operating spaces and said piston means, sealing means in said side members comprising a first outer sealing means for sealing the operating spaces between the piston means and the



contour of said central member of said housing and, second radial inner sealing means for sealing the bearing points of said piston means on said eccentric shaft means, means for lubricating said bearing points, said exhaust openings formed on one said side portions of the piston means lying in a region defined by an envelope curve generated during rotation of said piston means by the inner contour of said first radial outer sealing strip means as projected on said piston means and by the outer contour of said second radial inner sealing strip means, said exhaust openings having a triangular shape, said exhaust gas guide means provided in said one side member of said housing running substantially circumferentially and permanently communicating with said exhaust openings to prevent the formation of stagnant exhaust gas pockets in said exhaust gas openings.

3,883,277

ROTARY VANE DEVICE WITH IMPROVED SEALS

Leonard J. Keller, Sarasota, Fla., assignor to The Keller Corporation, Dallas, Tex.

Filed Oct. 11, 1973, Ser. No. 405,271
Int. Cl. F01c *1/00, 19/00;* F04c *1/00*
U.S. Cl. 418—137 **6 Claims**

1. In an eccentric rotor vane device having:

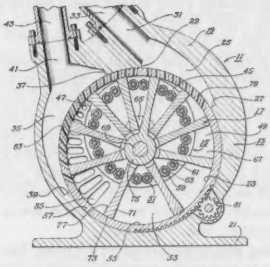
a. a main chamber having a substantially cylindrical interior surface;

b. first and second ports spaced around and communicating with said main chamber;

c. a plurality of annularly related radial vanes, independently pivotal and rotatable within said main chamber about a vane axis therewithin; said vanes occupying substantially the total radial distance from said axis to said interior surface of said main chamber;

d. a rotor that is eccentrically mounted with respect to said main chamber and rotatable about a rotor axis spaced from said vane axis; said rotor having follower means for interdigitating said vanes and effecting a change in volume of a subchamber intermediate respective said vanes as said rotor and said vanes are rotated within said main chamber; each subchamber being delineated by a pair of confronting vane faces and a corresponding follower means between said vane faces and said main chamber interior surface and varying from a minimum volume at a radially outermost position of said follower means with respect to said vane axis, said minimum volume position being referred to as the 0° position, to a maximum volume at the radially innermost position of said follower means, referred to as the 180° position; and

e. power delivery shaft connected with said rotor for delivering power in association therewith; the improvement comprising an improved seal means intermediate said vanes and said follower means in which:



f. each follower means is disposed intermediate adjacent said respective vanes and comprises a plurality of rotatably-mounted cylindrical rollers extending longitudinally of said rotor; each said roller having respective vane engaging surface; said plurality of said rollers intermediate adjacent vanes being contiguous each other; and

g. said vanes have lateral faces that are concaved inwardly toward the central plane of the vane such that said follower means is maintained in substantially uniform sealing engagement with said vane lateral faces as said follower means traverse inwardly and outwardly therealong during rotation of said rotor such that a satisfactory seal is maintained intermediate said follower means and said vanes so that said follower means can serve as a piston as well as an interdigitating means; and each said roller contiguous a lateral face of a vane engages said vane face with rolling friction for reduced friction and long life.

3,883,278

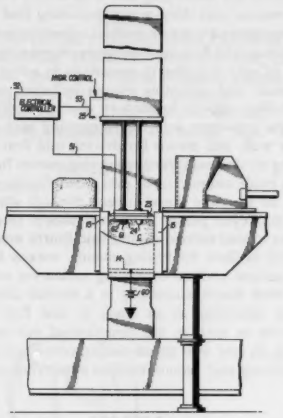
ANODE PRESS WITH VIBRATION AND COMPACTION RATE SENSING MEANS

Wynn M. Hass, Owensboro, Ky., assignor to Southwire Company, Carrollton, Ga. and National Steel Corp., Pittsburg, Pa.

Continuation-in-part of Ser. No. 163,766, July 19, 1971, abandoned. This application Nov. 28, 1973, Ser. No. 419,862
Int. Cl. B30b *11/02*
U.S. Cl. 425—135 **13 Claims**

10. Apparatus for forming a compacted block from particulate material comprising a mold, a press ram disposed above said mold and mounted for vertical movement therein, means for vibrating particulate material contained within said mold to expel air therefrom thereby compacting the material and causing the surface thereof to descend at a given rate, means in operative communication with the particulate material for continuously sensing the rate at which the surface of the material descends, and means responsive to said sensing means for continuously controlling the movement of said

press ram at a rate corresponding substantially to the rate at which the surface of the material descends whereby said press



ram will apply substantially no pressure against the material during compaction thereof.

3,883,279

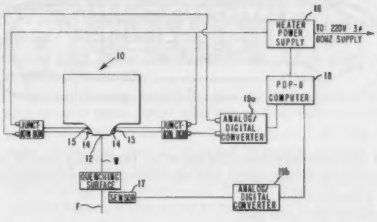
APPARATUS FOR MAKING POLYMERIC FILM

David Edward Heyer, Circleville, Ohio, assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 280,888, Aug. 15, 1972, abandoned. This application Aug. 2, 1973, Ser. No. 385,149

Int. Cl. B29f *3/08*

U.S. Cl. 425—141 **5 Claims**



1. An apparatus for improving the gauge profile of a web of polymeric film including:

an extrusion die for extruding a web of material onto a moving quenching surface;

means for selectively heating thermally isolated parts of die lips of the extrusion die;

means for pinning the web of material fully across its width to the quenching surface;

means for removing the web of material from the quenching surface in the form of a web of film;

means for measuring the thickness of the web of film across the width thereof and transmitting a signal based thereon; and

means for actuating the means for selectively heating the thermally isolated die lip parts of the extrusion die; based on such signal in a manner to improve the gauge profile of the web of film.

3,883,280

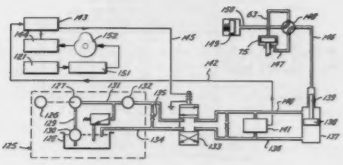
APPARATUS FOR CONTROLLING THE EXTRUSION OF PARISONS

Robert E. Waltman; John B. Coast, and Gary A. Hinz, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 129,142, March 29, 1971, which is a division of Ser. No. 887,939, Dec. 24, 1969, Pat. No. 3,649,148, which is a continuation-in-part of Ser. No. 695,636, Jan. 4, 1968, abandoned. This application June 7, 1973, Ser. No. 367,701

Int. Cl. B29d *23/04*

U.S. Cl. 425—162 **3 Claims**



1. In an apparatus for controlling the extrusion of plastic parisons, the combination comprising:

a. a cam having a peripheral surface conforming to the desired wall thicknesses of the extruded parison;

b. cam drive means;

c. means coupled to said cam to generate an electrical signal proportional to the shape of said cam;

d. means for controlling fluid pressure actuated by the means of subparagraph (c);

e. means for supplying fluid pressure to the means of subparagraph (d);

f. means coupled to the means of subparagraph (d) for boosting the pressure of the fluid from the means of subparagraph (e); and

g. means coupled to the means of subparagraph (f) for varying the wall thickness of said extruded plastic parisons.

3,883,281

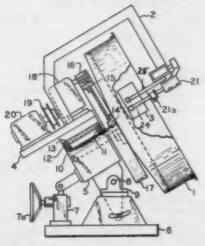
PELLETIZING DISC ASSEMBLY AND CONTROL SYSTEM

Carl A. Holley, Pittsburgh, Pa., assignor to Ferro-Tech, Inc., Pittsburgh, Pa.

Filed June 21, 1974, Ser. No. 481,820

Int. Cl. B29b *1/03*

U.S. Cl. 425—222 **3 Claims**

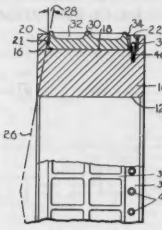


1. In apparatus for spraying water on granular material and for compressing the mixture into shapes, means for automatically controlling the amount of water sprayed onto the mixture controlled by a Wheatstone bridge in which the variable resistance leg comprises a pair of probes of substantially cylindrical shape extending in spaced parallel relationship into said mixture, and means for driving said probes about their axes to enable cleaning of the probes without excessive wear.

3,883,282
BRIQUETTING ROLL AND POCKETED SEGMENTS THEREFOR

William D. Armbrust, Greensburg; Dennis J. Shallenberger, Latrobe, and Charles E. Hill, Whitney, all of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Mar. 28, 1974, Ser. No. 455,518
Int. Cl. B29c *3/02*
U.S. Cl. 425—237 12 Claims

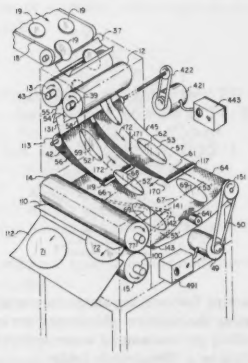


1. In a briquetting device; a roll having an outwardly opening annular groove formed in the periphery thereof, the bottom wall of said groove being in the form of planar chordal sections in end to end relation and each perpendicular to a respective radius of the roll, said groove when viewed in cross section having one side wall which forms an acute first included angle with the bottom wall of said groove while the other side wall forms a second included angle with said bottom wall which is larger than said first included angle, said side walls converging in the radially outward direction, said one side wall of said groove is in the form of an annular segment of a cone.

3,883,283
FLOUR DOUGH SHEET FORMING AND CONVEYING SYSTEMS

Frank J. Herrera, Downey, Calif., assignor to Casa Herrara, Inc., Los Angeles, Calif.

Filed May 29, 1973, Ser. No. 364,998
Int. Cl. A21c *3/02*
U.S. Cl. 425—337 18 Claims



1. In apparatus for forming rounded flour dough sheets from flour dough patties, the improvement comprising in combination:

first means for working flour dough patties into oval sheets of flour dough;

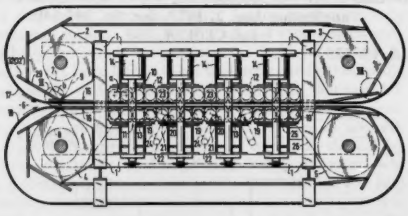
second means for working said oval sheets of flour dough into rounded flour dough sheets;

third means for conveying said oval sheets away from said first means, said third means including first endless conveying means having an endless conveyor web, means for mounting said first endless conveying means for conveyance of said oval sheets essentially in a first direction of advance, said mounting means including an essentially sheet-like support located at least partially inside said endless conveyor web for supporting said endless conveyor web, and means for driving said first endless conveying means, said third conveying means further including a blade connected to said sheet-like support so as to form an aperture therebetween through which said endless conveyor passes said oval sheets from said third means to said second means, said fourth means including second endless conveying means, means for mounting said second endless conveying means for conveyance of said oval sheets essentially in a second direction of advance extending at an angle to said first direction of advance as seen in the direction of gravitational force acting on said oval sheets during conveyance, and means for driving said second endless conveying means.

3,883,284
CONTINUOUSLY OPERATING ROUGH OR FINAL PRESS

Albert De Mets, Kachtem, Izegem, Belgium, assignor to Kronstrukiewerkhuizen de Mets N.V.

Filed Apr. 19, 1974, Ser. No. 462,543
Claims priority, application Germany, Apr. 19, 1973, 2320178
Int. Cl. B29c *15/00*
U.S. Cl. 425—371 17 Claims



1. A continuously operable press for producing panels, such as chipboards, fiberboards, and the like; said press comprising:

a first movable belt,

a second movable belt,

and guiding and moving means for guiding and moving said first and second belts with respective outer surfaces of said belts in facing relationship and moving in the same direction over a material pressing portion of the respective travel paths of said belts such that material forming said panels can be conveyed by and compressed between said belts along said material pressing portion of said respective travel paths,

wherein at least one of said first and second belts includes a plurality of belt plates articulatedly joined to one another by guide element means, the edges of said belt plates which extend at right angles to the travel direction of said belt plates including recess means and projection means, said recess means and projection means including interengageable flange portion means such that during operation of the press the flange portion means of one of the recess means and projection means of one plate engage and suport the flange portion means at the other of the recess means and projection means of the next adja-

cent plate over at least a portion of the respective travel path of said belts.

3,883,285

CONTINUOUSLY OPERATING PRESS FOR CHIPBOARDS, FIBERBOARDS, OR THE LIKE

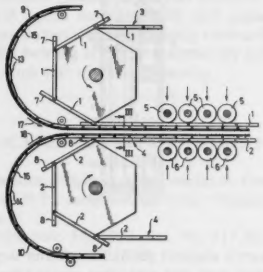
Albert DeMets, Kachtem, Izegem, Belgium, assignor to Konstruktiewerkhuizen DeMets N.V., Belgium

Filed Apr. 19, 1974, Ser. No. 462,545

Claims priority, application Germany, Apr. 19, 1973, 2320179

Int. Cl. B29c *15/00*

U.S. Cl. 425—371 **33 Claims**



1. A press for processing panels, such as chipboard, fiberboard, and the like; said press comprising:

a first plate belt including a plurality of belt plates articulated to one another,

a second plate belt including a plurality of belt plates articulated to one another,

guiding and moving means for guiding and moving said first and second plate belts with respective outer surfaces of said plate belts in facing relationship and moving in the same direction over a material pressing portion of the respective travel paths of said plate belts such that material forming said panels can be conveyed by and compressed between said plate belts along said material pressing portion of said respective travel paths,

a first movable continuous flexible band surrounding a portion of said first plate belt,

a second movable continuous flexible band surrounding a portion of said second plate band,

said first and second bands being interposed between said belts over said material pressing portion of the respective travel paths thereof for transferring pressing forces from said plate belts to the material forming said panels which is disposed between said first and second bands,

and a plurality of strips mounted to said first band at the side thereof facing away from the second band when said bands are in facing relationship along said material pressing portion of their travel paths for avoiding production of markings and panels being processed along the junction areas of the belt plates of said first plate belt, said strips extending transverse to the travel direction of the respective band and being mounted to permit relative movement of said strip and said first band in the plane of the junction of said strips and said first band.

3,883,286

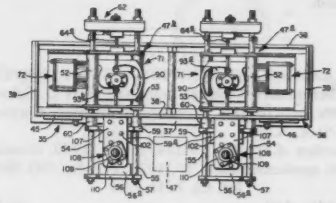
BLOW MOLDING METHOD AND APPARATUS

William G. Kinslow, Jr.; Paul A. Marchant, both of Kansas City, Mo.; Robert D. Bessier, Prairie Village, and Robert X. Hafele, Overland Park, both of Kans., assignors to Ethyl Development Corporation, Kansas City, Mo.

Division of Ser. No. 232,666, March 8, 1972. This application Dec. 17, 1973, Ser. No. 425,496

Int. Cl. B29c *1/16, 3/02*

U.S. Cl. 425—387 B **11 Claims**



1. In a blow molding apparatus an assembly for transporting a tubular parison between a parison supply station and a blow station the combination comprising:

a. a support frame including a base plate, a pair of side plates attached to opposite edges of said base plate;

b. wheel means attached to said support frame;

c. a pneumatic power means attached to said base plate;

d. a cam rotatively coupled to said power means;

e. a pair of cam followers coupled to said cam;

f. a pair of sleeves mounted between said side plates;

g. a pair of shafts slidably received in said sleeves;

h. a first platen attached to one end of said pair of shafts;

i. a second platen slidably mounted on said pair of shafts between said first platen and one of said side plates;

j. means coupling one of said cam followers to the other end of said pair of shafts; and

k. means coupling the other of said cam followers to said second platen.

3,883,287

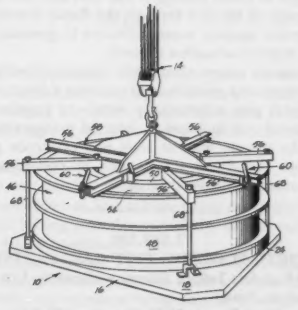
PNEUMATIC CORE PRESS

Charles E. Grawey; Glenn A. Ball, both of Peoria, and Donald G. Zook, Metamora, all of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed June 15, 1973, Ser. No. 370,204

Int. Cl. B29c *3/00*

U.S. Cl. 425—405 R **12 Claims**



1. Apparatus for pressing and forming granular material comprising:

a mold body defining an inwardly recessed portion; and a bladder associated with a mold body and inflatable to expand generally inwardly of the recessed portion thereof, to press and form granular material disposed in the recessed portion between the mold body and bladder, wherein the mold body comprises an annular mold body defining an annular recessed portion of generally U-shaped cross section said mold body further comprising inner and outer rings and a connecting ring removebly fixed relative to the inner and outer rings and the bladder comprises an annular bladder of generally U-shaped cross section and positioned inwardly of the annular recessed portion.

3,883,288

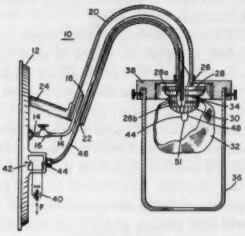
GAS LANTERN AND IGNITION SYSTEM THEREFOR

Don A. Berlincourt, Chagrin Falls, and Earl O. Schweitzer, Wickliffe, both of Ohio, assignors to Vernitron Corporation, Great Neck, N.Y.

Continuation of Ser. No. 96,324, Dec. 9, 1970, abandoned. This application Sept. 10, 1973, Ser. No. 395,904

Int. Cl. F21h *1/00*

U.S. Cl. 431—109 **10 Claims**



1. A gaseous or vaporized fuel lantern and ignition system therefor, comprising:

a substantially bag-like mantle of a fabric which is effective to provide light when in close proximity to a flame, and structural means supporting said mantle;

conduit means for supplying a stream of combustible fuel to said mantle, said conduit means including at the terminal end thereof a burner nose having a flame screen provided with a plurality of apertures for letting the fuel pass therethrough exclusively and in direct contact to establish a flame within said mantle,

said conduit means having an opening to receive air therethrough to cause mixing of the fuel and the air prior to discharge of the fuel through the flame screen;

piezoelectric ignition means effective to generate a voltage upon manual actuation thereof;

and electrode means electrically associated with said ignition means and positioned to establish a fixed and stationary spark gap substantially within or proximate to the stream of said fuel and in internal juxtaposition to said bag-like mantle with at least one electrode protruding through said flame screen with its end terminating in close proximity to said screen.

3,883,289

PIEZO-ELECTRIC TYPE GAS LIGHTER

Masayuki Fujioka, Tokyo, Japan, assignor to Leo Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1973, Ser. No. 421,733

Int. Cl. F23q *2/08*

U.S. Cl. 431—131 **6 Claims**

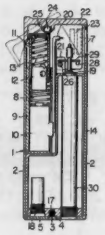
1. A piezo-electric gas lighter comprising:

a housing having four side walls, a bottom wall with a hole therein, and an open top;

an L-shaped fuel tank, the lower, wider, transverse portion of which fits within the bottom inside of said housing, said fuel tank having projections extending from the top thereof and a screw hole in the bottom in alignment with said hole in said bottom wall of said housing;

a combustion valve having a tubular body mounted within the elongated portion of said fuel tank and having a valve body extending through the top of said fuel tank adjacent said projections;

operating means having an L-shaped configuration and being pivotally mounted to said projections, said operating means also serving as the cover of said lighter housing when in its normal position with respect to said housing; means coupled between said operating means and said combustion valve to permit fuel to flow out of said valve when said operating means is pivoted away from its normal position;



a piezo-electric element positioned on the stepped portion of said fuel tank and extending upward therefrom adjacent and parallel to said elongated portion of said fuel tank, said piezo-electric element having a top plate, said operating means, when in its normal position, having its elongated portion extending across the top of said piezo-electric element and its short transverse portion extending down the side of said piezo-electric element past the top thereof, thereby coupling said piezo-electric element, said fuel tank and said operating means together as a unit; said operating means having means for engaging said top plate of said piezo-electric element for actuation of said piezo-electric element by depression of said top plate to produce an electrical discharge simultaneously with the flow of fuel from said combustion valve to ignite said lighter when said operating means is pivoted away from its normal position; and

a screw for removably securing together said housing with the unit comprising said piezo-electric element, said operating means and said fuel tank by passing through said hole in said bottom wall of said housing and engaging said screw hole in the bottom of said fuel tank.

3,883,290

APPARATUS FOR THE PRODUCTION OF HOT GASES

Herbert Windelbandt, Schlottfelderstr. 2, D 5105 Aachen, Germany

Filed Nov. 3, 1972, Ser. No. 303,601

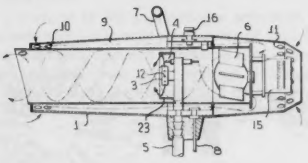
Claims priority, application Germany, Nov. 11, 1971, 2155055; June 27, 1972, 2231345

Int. Cl. F23d *11/04*

U.S. Cl. 431—168 **12 Claims**

1. Apparatus for the production of hot gases comprising an elongated guide pipe having a longitudinal axis and a discharge opening, a burner disposed concentrically within and relative to said guide pipe, said burner including nozzle means for directing fuel generally radially outwardly of the longitudinal axis, conduit means for connecting said burner nozzle means to a source of combustible fuel, ignition means adja-

cent said burner for igniting the combustible fuel being discharged from said burner nozzle means, an axial blower disposed concentrically within and relative to said guide pipe for creating a swirling air stream through said guide pipe toward said discharge opening, said swirling air stream including low volume air flow along said longitudinal axis and higher volume air flow radially outwardly therefrom, said burner and ignition



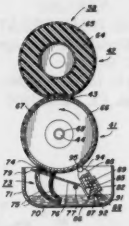
means being disposed between said blower and said discharge opening, and said ignition means being disposed within said area of low volume flow whereby fuel directed radially outwardly of said nozzle means toward said guide pipe when ignited creates flames directed radially outwardly from said burner into the swirling air stream created by said blower for discharge through said discharge opening.

3,883,291

OIL APPLICATOR FOR REPRODUCTION MACHINE FUSER

Eugene F. Cloutier, Brighton, and Douglas P. Connolly, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1973, Ser. No. 417,462
Int. Cl. B05c *8/00*
U.S. Cl. 432—60 **6 Claims**



4. In a reproduction machine adapted to produce copies of documents, said machine having cooperating pressure and heated rolls for fusing images developed on the copy material, the combination of:

applicator means to apply a liquid release material to the fuser heated roll to prevent copies from adhering thereto, wiper means engageable with the periphery of said fuser heated roll to remove excess release material therefrom before contact with the copy material being fused; and

bias means to bias both said applicator means and said wiper means into contact with said fuser heated roller.

3,883,292

SLEEVELESS PRESSURE ROLL CLEANER

Ralph A. Hamaker, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1973, Ser. No. 364,574
Int. Cl. F03g *13/20*
U.S. Cl. 432—60 **10 Claims**

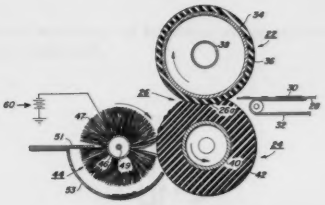
1. Apparatus for fusing electroscopic toner particles to a substrate, said apparatus comprising:

a first roll member;

a second roll member mounted for simultaneous rotation with said first roll member and in contact therewith;

means for heating one of said roll members; and

means for cleaning toner particles from the other of said members, said toner cleaning means comprising a brush rotatable in contact with the surface of said other member and including a plurality of metallic bristles.



7. The method of fusing electroscopic marking particles to the substrate in image configuration comprising the steps of: contacting said marking particles with a heated roll member and simultaneously contacting the back side of said substrate with a pressure roll member; and

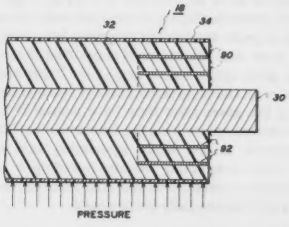
rotating a metallic brush in contact with the surface of said pressure roll member to remove marking particles therefrom.

3,883,293

PRESSURE ROLL CONSTRUCTION

Alan F. McCarroll, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 5, 1974, Ser. No. 458,159
Int. Cl. B60b *7/02;* **F27b** *9/28*
U.S. Cl. 432—60 **3 Claims**



1. In a heated pressure roll fusing system for fusing toner images of electrostatic copying machines in which a heated fuser roll is urged into pressure contact with a relatively soft pressure backing roll, an improved pressure roll device comprising,

a core member,

a cylindrical member made of rubber positioned around said core member, said rubber being relatively thick and soft and having a tendency to bulge at the ends thereof under fusing conditions,

said cylindrical member being formed with at least one thin stiffening member inserted at each of the ends thereof said stiffening members being circular in shape and having a thickness ranging from about .001 inches to about .010 inches to minimize end bulge to improve fusing and reduce wear.

3,883,294

HEAT TREATING APPARATUS

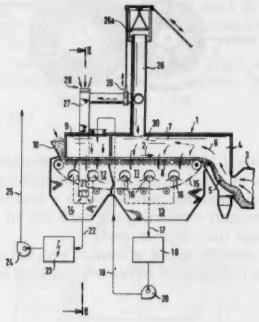
Horst Ritzmann; Hans Mollenkopf, both of Neubeckum; Wolf Goldmann; Jurgen Wurr, both of Ennigerloh, and Reinhard Körting, Neubeckum, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Nov. 5, 1973, Ser. No. 412,632

Claims priority, application Germany, Nov. 15, 1972, 2256034

Int. Cl. F27b 7/02, 7/36

U.S. Cl. 432—107 9 Claims



1. A device for the heat treatment of material with hot gas comprising: a traveling grate including a section for supporting material to be treated and conveying it in a forward path of travel; means including at least one heat treatment chamber above said grate section for directing hot gases from one side of said grate and the material supported thereby to an intermediate grate space below and at the other side of said grate and said material supported thereby; dust removal means for purifying the gases after they have passed through the material; and means connecting the heat treatment chamber to said dust removal means while by-passing said traveling grate section, said connecting means including a tubular by-pass tube conduit connected to the dust removal means via a portion of said intermediate grate space.

3,883,295

ROTARY HEARTH FURNACE

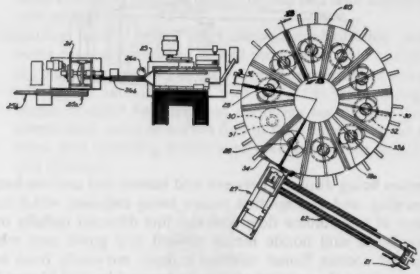
Ernest W. Lowderman, Independence; Leland L. Barrington, Overland Park, and Ferdinand Young, Jr., Independence, all of Mo., assignors to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 297,886, Oct. 16, 1972, Pat. No. 3,827,267. This application Feb. 4, 1974, Ser. No. 439,411

Int. Cl. F27b 9/16

U.S. Cl. 432—138 16 Claims

1. A furnace for heating a plurality of coils of rod; said furnace having a single, unitary gas fired heating chamber; a rotary hearth for said chamber, said hearth having a plurality of openings therein; a spindle-turntable within each said opening and clear of said hearth, each said spindle-turntable being adapted to receive at least one coil of rod to be heated within said chamber; frame work located beneath said hearth so as to support same, each said spindle-turntable also resting on



said frame work; bearing means on which said frame work is engaged for purposes of rotation; a charging station for said chamber; an unreeling station for said chamber; and indexing means for moving said frame work, hearth and spindle-turntables so as to move a coil through substantially all of said chamber from said charging station to said unreeling station.

3,883,296

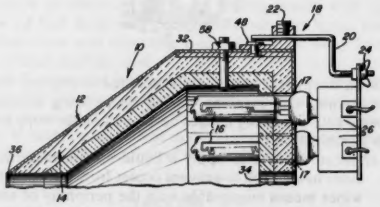
PORTABLE METAL HEAT TREATING FURNACE

Betty J. Salvage, and Donald R. Salvage, both of 465 Solano Ave., Hayward, Calif. 94541

Filed Jan. 16, 1973, Ser. No. 324,071

Int. Cl. F27d 1/00

U.S. Cl. 432—247 6 Claims



1. A heat treating furnace comprising, in combination:

a. an encasement forming a housing;

b. an insulating liner arranged within the encasement and housed thereby, the liner having a pair of layers; one layer being constructed from a rigid insulation material, and the other layer being constructed from a blanket insulation material, the layer of rigid insulation material being arranged adjacent to and between the layer of blanket insulation material and the encasement, each layer capable of withstanding temperatures of at least 2,000°F; and

c. means for removably and replaceably attaching the layers of insulation material to the encasement.

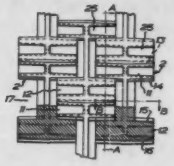
3,883,297

FRAMEWORKS FOR SHIELDING DEVICES

Gustav Nobelius, Hagersten, Sweden, assignor to Bruun & Sorensen AB, Farsta, Sweden

Filed Apr. 3, 1974, Ser. No. 457,463
Claims priority, application Sweden, Apr. 9, 1973, 7349629
Int. Cl. F23m *5/00, 5/02*
U.S. Cl. 432—249 8 Claims

1. In a framework for supporting a refractory lining, the improvement which comprises a plurality of detachably interconnected elements disposed to receive and support a refractory lining, said elements being generally H-shaped and oriented with the legs of adjacent elements in lengthwise contact, the legs of said elements having curved surfaces accommodating said lengthwise contact, and the curved surfaces on the legs of adjacent elements being generally complementary to



allow pivotal movement of individual elements for replacement in the framework.

CHEMICAL

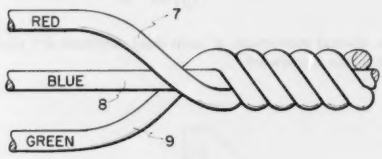
3,883,298
ENERGY RESPONSIVE THREAD

Gerald Platt, 727 South 1100 East, Salt Lake City, Utah 84102

Continuation of Ser. No. 865,917, Oct. 13, 1969, abandoned. This application Nov. 10, 1972, Ser. No. 305,368

Int. Cl. D06p 5/00

U.S. Cl. 8—2 7 Claims



1. A method of sewing a colored fabric comprising
a. stitching said fabric with a thread having three light sensitive dyes which develop a specific, permanent color upon exposure to light, and
b. exposing said thread to light to develop a color matching that of the fabric in the immediate vicinity of said thread.

3,883,299
DYEING AND PRINTING TEXTILES WITH VAT DYES USING REDUCTONES AND/OR REDUCTONATES

Ulrich Baumgarte; Siegfried Weigold, both of Limburgerhof, and Werner Scheuermann, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 20, 1972, Ser. No. 316,865

Claims priority, application Germany, Dec. 24, 1971, 2164463

Int. Cl. D06p 1/24

U.S. Cl. 8—34 12 Claims

1. A process of dyeing or printing cellulose textiles with vat dyes in a pH range from about 12 upward wherein hydroxyacetone, dihydroxyacetone, glycol aldehyde, dihydroxybutanone, 2,3-dihydroxyacrylaldehyde (triosereductone), ascorbic acid, cyclopentenediolone (reductic acid), ethyl α-amino-β-ketobutyrate or a mixture of two or more of these is used as reducing agent in the presence of a quinoid compound which is soluble in water within the said pH range.

3,883,300
PROCESS FOR REDUCING SHRINKAGE AND IMPROVING CREASE RETENTION OF WOOL-SYNTHETIC FIBER BLENDS

Clyde T. Moore, Bennettsville, and Harry L. Mercer, Cheraw, both of S.C., assignors to J. P. Stevens & Co. Inc., New York, N.Y.

Filed June 28, 1972, Ser. No. 266,850

Int. Cl. D06m 9/00

U.S. Cl. 8—115.7 6 Claims

1. A process of treating yarns and fabrics produced therefrom, the yarns being composed of blends of proteinaceous fibers having overlapping scales and synthetic thermoplastic fibers having heat settable memory at conventional garment pressing temperatures, in order to reduce shrinkage and improve crease retention on washing, which consists essentially in shrink-proofing said proteinaceous fibers by oxidizing them with an acidic aqueous solution of a chlorinating agent for said proteinaceous fibers, removing the acidic aqueous solution, subjecting a fabric composed of said yarns to creasing by pressing in creases in a conventional garment press under conventional garment pressing conditions, whereby said fabrics exhibit increased crease retention on washing and drying.

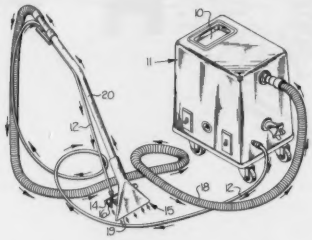
3,883,301
METHOD OF CLEANING TEXTILE FABRICS

Donald G. Emrick, Fort Lauderdale; Joseph H. Christian, and Robert M. Hines, both of Raleigh, all of N.C., assignors to U.S. Floor Systems, Inc., Raleigh, N.C.

Filed June 21, 1973, Ser. No. 372,201

Int. Cl. A47l 7/00

U.S. Cl. 8—158 3 Claims



1. A method of cleaning textile fabric such as carpet, upholstery and the like wherein cleaning of the fabric is maximized while adverse effects on the fabric are minimized due to operation within optimal parameters, the method comprising the steps of:
spraying a solution of hot water and detergent in a predetermined zone and against fabric to be cleaned from a distance of about 2 inches and at a pressure of about 26 pounds per square inch and at a flow rate of about one gallon per minute, while
drawing air through the fabric in a predetermined zone spaced from the spraying zone at a distance of about 2 inches and withdrawing the solution and soil from the fabric into a vacuum conduit having a sealed orifice lift of about 115 inches of water.

3,883,302
HIGH-BULK POLYACRYLONITRILE YARN

Werner Amend, Wuppertal-Barmen, Germany, assignor to Hacoba-Textilmaschinen GmbH & Co. KG, Wuppertal-Barmen, Germany

Continuation of Ser. No. 90,034, Nov. 16, 1970, abandoned. This application Dec. 26, 1972, Ser. No. 318,560

Int. Cl. D06p 5/06

U.S. Cl. 8—172 1 Claim

1. A method of making high-bulk polyacrylonitrile yarn covered with cationic dyes, which comprises the steps of treating unbulked polyacrylonitrile yarn in a bath at a temperature beneath 70°C and its glass transition temperature with an aqueous acid liquor containing a cationic dye and benzyloxypropionitrile as a polar organic compound which swells or solubilizes the fibers of said yarn, and thereafter subjecting the yarn to damp heat treatment at a temperature of substantially 98°C to 100°C, the yarn being subjected to the treatment with the aqueous acid liquor while coiled on spools, is then rinsed, finished and centrifuged and is finally rewound from the spools on to user spools while being maintained free from tension during the rewinding process during the damp heat treatment for a period of 5 seconds to 15 minutes.

3,883,303
METHOD FOR CONTROLLING ODORS IN RECIRCULATING TOILETS

George C. Roberts, Venice, Calif., assignor to Inca-One Corporation, Culver City, Calif.

Filed June 15, 1972, Ser. No. 263,190
Int. Cl. A61l *11/00, 13/02*
U.S. Cl. 21—55 2 Claims

1. A method for controlling odors and inhibiting growth of microorganisms in recirculating toilets containing water, organic waste material and microorganisms which consists essentially in: mixing paraformaldehyde with the water contained in said toilet, said water having a temperature of between 0°C and 40°C and containing borax to adjust the pH of the water and paraformaldehyde to between 5 and 8, the amount of paraformaldehyde being from 100 part per million to 5,000 parts per million, by weight, based upon the contents of the toilet so that sufficient paraformaldehyde dissolves in said water and slowly releases formaldehyde to form a solution and to react with any mercaptans, bioorganics and other components of human waste contained in the toilet and to inhibit the growth of microorganisms without killing said microorganisms and thus not interfering with subsequent biological decomposition on later dumping of the contents of the recirculating toilet, said components of human waste tending to lower the pH of the solution to the acidic side thus increasing the solubility of the paraformaldehyde and thereby providing more formaldehyde in solution for reaction with additional components of human waste while said borax, without reacting with said formaldehyde in solution is tending to raise said pH above about 5 to control and maintain the desired concentration of formaldehyde in solution.

3,883,304
METHOD FOR TESTING PREGNANCY

Clayton H. Hamilton, Cross Lake, Minn., assignor to Conifer Laboratories, Inc., Cross Lake, Minn.

Continuation-in-part of Ser. No. 257,016, May 25, 1972, abandoned. This application June 6, 1974, Ser. No. 476,882
Int. Cl. G01n *31/20, 33/16*
U.S. Cl. 23—230 B 12 Claims

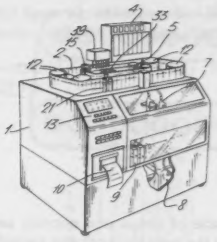
1. A method of testing female blood to determine pregnancy comprising the steps of placing a small amount of said blood and a small amount of a test reagent on a testing surface, said test reagent comprising dissolved sodium chloride in the approximate ratio of between 0.63 and 1.08 grams per 100 cc of said test reagent and an acid selected from the group consisting of nitric acid, surfuric acid, hydrochloric acid, and acetic acid each in the approximate percentage of between 0.15 and 0.35%, thoroughly mixing said blood and said test reagent, and detecting the extent of agglutination of the blood.

3,883,305
AUTOMATIC CHEMICAL ANALYSIS APPARATUS

Douglas Haig Hoskins, St. Albans; Thomas Horne, Woburn Bletchley; Graham Roger Jarman, and Arthur William Dunsmore, both of Dunstable, all of England, assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Mar. 14, 1973, Ser. No. 341,069
Claims priority, application United Kingdom, Mar. 21, 1972, 13241/72
Int. Cl. G01n *33/16, 1/18*
U.S. Cl. 23—253 R 27 Claims

1. An apparatus for automatic chemical analysis comprising: a first sequentially advanceable conveyor for carrying containers holding samples to be tested; a second sequentially advanceable conveyor for carrying reaction tubes in which chemical reactions can be caused to occur; said conveyors defining paths which lie one within the other; first and second transfer stations fixedly positioned along the path of said first and second conveyors, respectively; transfer structure positioned adjacent said first and second stations for sequentially transferring sample portions from each container, when it is at said first station, to a predetermined plurality of the reaction tubes as they are moved past said second station; apparatus capable of adding different reagents to each of said plurality of reaction tubes; a programmed drive arrangement for advancing said first conveyor to present a next sample container

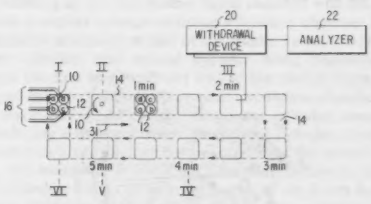


to said first station in conjunction with advancing said second conveyor to present a next plurality of reaction tubes sequentially to said second station for sample transferring; and testing equipment for testing the reaction products of each of said plurality of reaction tubes.

3,883,306
AUTOMATIC ANALYZING ARRANGEMENT

John Ake Widen, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Nov. 23, 1973, Ser. No. 418,175
Claims priority, application Sweden, Nov. 23, 1972, 15259/72
Int. Cl. G01n *1/10, 1/14*
U.S. Cl. 23—253 R 9 Claims



1. An arrangement for conveying receptacle holders along a predetermined path to different treatment stations in an automatic analyzing apparatus, said arrangement comprising means for conveying at least one holder along the path, means located at at least one location along the path for selectively rotating the holder relative to the path, the angle of rotation being equal to the angle formed between a radial line between the center of rotation of the holder and one receptacle of the holder and a radial line between said center of rotation of the holder and another receptacle of the holder, means for supplying a fluid to at least one receptacle, means for recovering the contents of the receptacle to which the fluid is added and means for analyzing the recovered contents.

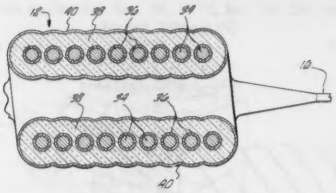
3,883,307
GAS ANALYZER RESISTANCE ELEMENT

Young Ho Kim, Palo Alto, Calif., assignor to Ambac Industries Inc., Garden City, N.Y.

Continuation-in-part of Ser. No. 191,170, Oct. 21, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,035
Int. Cl. B01j *11/08;* G01n *31/12*
U.S. Cl. 23—254 E 16 Claims

1. A catalytic combustion resistance element comprising a ceramic coated wire over which a catalytic layer is formed, in

which the catalytic layer comprises individual particles of a powdered oxide selected from the class of oxides consisting of alumina and beryllia, each of said particles being individually coated with a metallic catalyst, said powdered particles being



of an average size of about one micron, and binder agent means attaching the individual catalyst coated oxide particles to one another so as to form a porous outer layer of the catalyst coated particles.

3,883,308

APPARATUS FOR ANALYSING LIQUID SUBSTANCES LIKELY TO FORM AGGLUTINATES

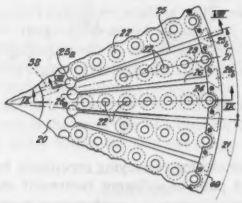
Claude Matte, Paris, France, assignor to Centre National de la Recherche Scientifique and Centre National de Transfusion Sanquine, Paris, France, a part interest to each

Continuation of Ser. No. 163,936, July 19, 1971, abandoned, which is a continuation of Ser. No. 728,189, May 9, 1968, Pat. No. 3,617,222. This application Sept. 4, 1973, Ser. No. 393,996

Claims priority, application France, May 12, 1967, 67.106180; Mar. 22, 1968, 68.145043

Int. Cl. G01n *33/16, 1/14*

U.S. Cl. 23—259 **2 Claims**



1. As a mechanical subassembly of a liquid chemical or biochemical analyzing machine, a support for a multiplicity of vessels adapted to contain liquid samples comprising:

an annular substantially planar shaped member having a central opening therein, said member defining a multiplicity of apertures each adapted to receive and positively to maintain a vessel, said apertures being disposed angularly and radially on said member throughout substantially the entire area thereof, said multiplicity of apertures being formed in groups of apertures, the apertures of each group being spaced along a respective line of a plurality of lines extending radially from the center of said member to the periphery thereof,

vessels in said apertures, each vessel having an axis of symmetry of revolution and a transparent concave bottom, each vessels' shape being substantially that of a cupola connected to opaque side walls inclined relative to the axis of symmetry of said vessel with each vessel having a bulbous portion adjacent the bottom thereof, and

means on said member for angularly positioning said member with respect to a shaft of said machine adapted to pass through said central opening.

3,883,309

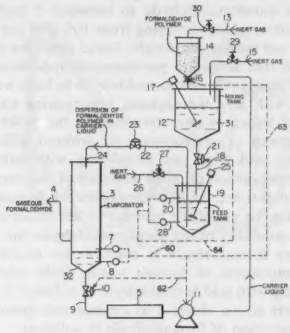
APPARATUS FOR THE GENERATION OF GASEOUS FORMALDEHYDE FROM FORMALDEHYDE POLYMER

Kazutomo Ishizawa; Yasunori Nagata, and Hisakazu Ikui, all of Osaka, Japan, assignors to Kanebo Ltd., Tokyo, Japan

Filed Aug. 8, 1972, Ser. No. 278,874

Int. Cl. B01d *1/00;* **B01j** *7/00;* **C07c** *47/04*

U.S. Cl. 23—260 **11 Claims**



1. In an apparatus for generating gaseous formaldehyde from a formaldehyde polymer comprising

a. one or more mixing tanks for preparing a dispersion of the formaldehyde polymer in a liquid carrier,

b. a feed tank for receiving the dispersion from the mixing tank and feeding the dispersion to the evaporator set forth below,

c. an evaporator for heating the dispersion at the temperature of formaldehyde gas generation, and

d. a cooler for cooling the liquid carrier discharged from the evaporator, the improvement which comprises:

said four members (a), (b), (c) and (d) are connected in series in that order, said mixing tank (a) being connected to a means for feeding the formaldehyde polymer as finely divided particles to said mixing tank (a), and said evaporator (b) being provided at the upper part thereof with an inlet feed means comprising an overflow means for making the dispersion flow into the evaporator in the state of overflow, said evaporator further having a formaldehyde gas discharge conduit, liquid level control means having upper and lower liquid level detecting probes, both probes being disposed below said formaldehyde gas discharge conduit and a liquid carrier discharge means disposed below said lower probe, said liquid level control means maintaining the free surface of the liquid carrier collected at the bottom of the evaporator at a height between the detecting probes by discharging the liquid carrier from the bottom of the evaporator in response to a signal from the liquid level control means.

3,883,310

TAPERED ORE LEACHING VESSEL

Clearl Don Killgore, Redondo Beach, Calif., assignor to Clearl D. Killgore and Harold Von Killgore, both of Redondo Beach, Calif., part interest to each

Filed June 5, 1972, Ser. No. 259,436

Int. Cl. B01d *11/02*

U.S. Cl. 23—267 R **4 Claims**

1. In apparatus for leaching ore,

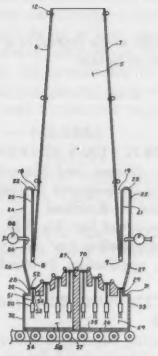
an upright elongate walled vessel of tapered form having a minimum cross-sectional area at the uppermost end thereof enlarging to a maximum cross-sectional area proximate the lower end thereof for containing said ore,

a plurality of manifolds connected to said vessel at a plurality of vertically spaced-apart locations along the length of said vessel between said uppermost end and said lower end thereof, each of said manifolds having a plurality of individual passages communicating said manifolds to said vessel for injecting leaching solution into said vessel at each said vertically spaced-apart location,

a plurality of individual vertically and laterally spaced-apart passages proximate and within the lower end of said vessel for injecting fluid upward into said vessel,

a plurality of channels in spaced-apart relationship and varying heights, each of said channels having a trapdoor mounted at the upper end thereof adapted to be selectively opened to receive the spent ore, said trapdoors being at different vertical heights relative to said lower end of said vessel for regulating the flow of spent ore down through the vessel and avoiding congestion of said spent ore,

a center wall proximate the lower end of said vessel and perpendicular to the bottom wall of said vessel to serve as a divider between two common areas into which said



spent ore will flow when said trapdoors are selectively opened,

a plurality of pistons having at least two forked arms in a juxtaposed relationship to said trapdoors,

a plurality of hydraulic cylinders proximate and within said lower end of said vessel, each said cylinder adapted to contain each said piston, each said cylinder supported by forked pillars which provide an arch under which the spent ore can be allowed to fall to the bottom of said vessel,

a plurality of conventional hinges, each said hinge secured to the center of each said trapdoor so that when each said piston is raised by each said hydraulic cylinder, said forked arms of each said piston will cause each said trapdoor to move upward taking the shape of an inverted V when it is fully opened, thus permitting a passage for the movement of spent ore around each said trapdoor as the opposite ends of each said trapdoor draw closer together, and

a plurality of regulated doors in spaced-apart relationship at the bottom of said vessel, beneath said hydraulic cylinders, for maintaining an even flow of spent ore through said vessel, each said regulated door adapted to be selectively opened for removal of said spent ore after said spent ore has passed into said common areas.

3,883,311
REACTION CRYSTALLIZER

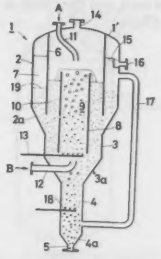
Toshio Kanai, Yokohama; Masaaki Noguchi; Hiroshi Yanagioka, both of Tokyo; Yosio Kogawa, Yokohama, and Susumu Kondo, Kawasaki, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Sept. 22, 1972, Ser. No. 291,292

Claims priority, application Japan, Sept. 23, 1971, 46-74425

Int. Cl. B01d 9/00; B01j 1/00

U.S. Cl. 23—273 R **4 Claims**



1. A reaction crystallizer which comprises in combination a closed vertical reaction tank having a cylindrical cross section and an upper barrel having the largest diameter, a middle barrel having a smaller diameter than said upper barrel and a lower barrel defining a classification zone having a smaller diameter than said middle barrel, a first inner cylinder suspended from the top of the reaction tank and having a diameter smaller than that of the upper barrel, said first inner cylinder defining an annular mother liquid chamber with the upper barrel, a second cylinder defining a reaction chamber having a diameter smaller than that of the middle barrel and the first inner cylinder, said second cylinder being disposed from within the first inner cylinder and to the middle barrel, said second cylinder defining an annular circulation chamber with the inner surface of the said first inner cylinder, means for introducing a first reactant to the second cylinder, means for introducing air to an open bottom portion of the second cylinder, and means for introducing a second reactant to the second cylinder, means for introducing air to the lower barrel, a crystal discharge passage disposed at the lower portion of the lower barrel, recycle pipe disposed for passing mother liquor from the mother liquor chamber to the lower barrel defining the classification zone, a discharge passage for overflow of mother liquor disposed near the upper portion of the upper barrel, and a gas discharge disposed on top of the reaction tank, whereby fine crystals produced in the reaction tank remain suspended, with coarse crystals passing to the classification zone.

3,883,312
MOVING-BED REACTOR WITH WITHDRAWAL OF CATALYST AND EFFLUENT THROUGH THE SAME CONDUIT

Gary A. Youngman, Buffalo Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 8, 1973, Ser. No. 414,036

Int. Cl. B01j 9/12

U.S. Cl. 23—288 G **3 Claims**

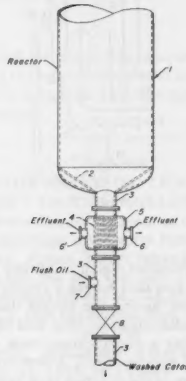
1. A moving-bed reactor apparatus through which solid catalyst particles forming a catalyst bed descend by the action of gravity, which apparatus comprises:

a. a vertically disposed cylindrical vessel;

b. a reactant inlet conduit interconnected with an upper portion of said vessel;

c. a catalyst inlet conduit interconnected with an upper portion of said vessel;

d. a combined catalyst and reactor effluent outlet conduit located on a bottom portion of said vessel, said combined catalyst and reactor effluent outlet conduit extending downward and containing a vertically disposed perforated section having openings no larger in size than said catalyst particles, an annular casing surrounding said perforated section forming an annular chamber therebetween, an effluent discharge port disposed in said annular casing and laterally opposite said perforated section, whereby the reactor effluent will pass from the catalyst withdrawal conduit through said perforated section and said discharge port and the catalyst will be separated from the reactor effluent;



e. a wash oil inlet conduit communicating with said combined catalyst and reactor effluent outlet conduit at a point below said perforated section, whereby catalyst and reactor effluent may be withdrawn from the moving-bed reactor through said combined catalyst and reactor effluent outlet conduit, the catalyst being withdrawn downward past the perforated section and washed by said wash oil entering through said wash oil inlet conduit and passing upward, said wash oil being exited through said perforated section and said effluent discharge port with said reactor effluent; and,

f. a plurality of inert ceramic balls of a diameter larger than that of said catalyst particles filling said annular chamber to thereby reduce pressure drop due to reactant flow and promote a more uniform drainage pattern in said catalyst bed.

3,883,313

MODIFIED CZOCHRALSKI-GROWN MAGNESIUM ALUMINATE SPINEL AND METHOD OF MAKING SAME

Glenn Wherry Cullen, Princeton, N.J.; Stephen Ray Bolin, Reading, Mass.; John Francis Corboy, Ringoes, N.J.; John Elvin Creamer, San Juan Capistrano, Calif., and Alan John Wasielewski, Beachwood, N.J., assignors to RCA Corporation, New York, N.Y.

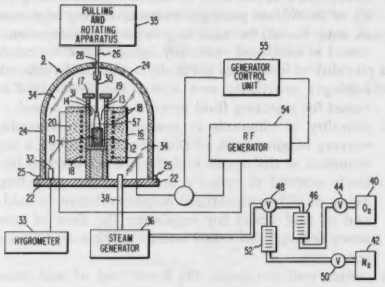
Filed Dec. 14, 1972, Ser. No. 314,974

Int. Cl. B01j *17/24;* **C01f** *7/02;* **H01h** *3/10*

U.S. Cl. 23—301 SP **7 Claims**

1. In a Czochralski method for growing a single-crystal of spinel material comprising the steps of melting a source of spinel material to form a melt, contacting a seed crystal of the spinel material to a portion of said melt, and relatively moving said seed crystal with respect to said melt, whereby successive portions of said melt are frozen out on said seed crystal, the improvement comprising:

providing an ambient comprising an inert gas and oxygen, saturated with water vapor and contacting said melt, and



thus growing said single crystal of spinel material containing OH ions in its lattice.

3,883,314

SELF-LUBRICATION BEARING MEMBER

Edouard Schnyder, Bienne, and Marcel Liengme, Cormoret, both of Switzerland, assignors to Omega, Louis Brandt & Frere S.A., Bienne, Switzerland

Continuation-in-part of Ser. No. 149,395, June 2, 1971, abandoned. This application Apr. 12, 1973, Ser. No. 350,500

Claims priority, application Switzerland, June 29, 1970, 9775/70

Int. Cl. C22c *29/00;* **B22f** *3/16;* **C22c** *1/04*

U.S. Cl. 29—182.5 **13 Claims**

1. A self-lubricating bearing member comprising a porous metallic base material selected from the group consisting of a metal, a metal alloy, a metal carbide, a metal nitride, a metal boride, a metal silicide, a metal oxide, and mixtures thereof having a porosity of between about 1 and about 40 percent by volume and a hardness of between about 200° and about 2,400° Vickers, the pores of which are filled with a lubricant having a coefficient of friction of between about 0.002 and about 0.300 and viscosity of at least 1.5° Engler at the temperature of use.

6. Method for the manufacture of a self-lubricating bearing member comprising the steps of:

a. forming a homogeneous mixture of a metallic base material selected from the group consisting of a metal, a metal alloy, a metal carbide, a metal nitride, a metal boride, a metal silicide, a metal oxide, and mixtures thereof, and a metal soap, these components being in a pulverulent state;

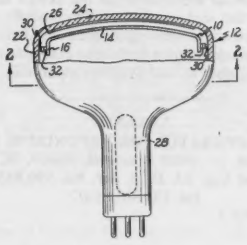
b. compressing the mixture of metallic base material and metal soap at a pressure between about 2 and about 15 metric tons per square centimeter;

c. subjecting the compressed mixture to a thermal treatment in an inert atmosphere at a temperature between about 1,200° and about 1,800°C for a sufficient period of time to impart thereto a porosity of between about 1 and about 40 percent by volume;

d. introducing a lubricant into the pores of the product of step (c); and

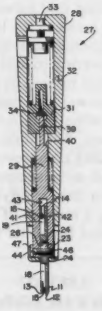
e. shaping the product into a bearing member.

3,883,315
SHADOW MASK FOR A COLOR TELEVISION IMAGE TUBE
Unto U. Savolainen, and Henry Ty, both of Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 13, 1972, Ser. No. 314,872
Int. Cl. B23p *15/16*
U.S. Cl. 29—183.5 **17 Claims**



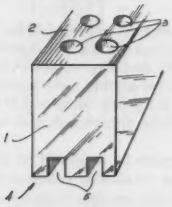
1. An improved shadow mask for a color television image tube comprising a thin metal sheet having a translucent area defined by a multiplicity of dot-like apertures extending through said sheet, said thin metal sheet being of a composite metal laminate material embodying at least one layer of mild steel material and embodying at least one layer of metal of relatively greater thermal conductivity than said mild steel material for reducing the occurrence of local temperature differentials across said translucent mask area to prevent local thermal distortion of said translucent mask area.

3,883,316
TERMINATION TOOL BLADE
John R. Mason, Los Angeles, Calif., assignor to Dracon Industries, Chatsworth, Calif.
Filed May 3, 1974, Ser. No. 466,733
Int. Cl. H01r *43/00*
U.S. Cl. 29—203 HT **8 Claims**



1. A reversible blade for use in a tool for terminating electrical conductors at a termination clip and having a retaining screw for retaining the blade therein, comprising an elongate blade body, a first end on said elongate body having a cutting edge and a seating edge formed thereon, a second end on said elongate body having seating edges formed thereon, said first and second ends each having longitudinal recesses therein for receiving the termination clip, first and second opposing surfaces on said elongate body for contacting the retaining screw, and serrations on said first and second surfaces, whereby when said blade is retained in the tool and one of said first and second ends extends therefrom, said serrations on said first and second opposing surfaces respectively engage the retaining screw, thereby preventing loosening of the retaining screw and rotation of the blade with respect to the tool.

3,883,317
SELF-SUPPORTING, TOTALLY COMBUSTIBLE UNIT
Fuhad Abdala Neme, Avelino Maure 732, Mendoza, Argentina
Filed Jan. 4, 1972, Ser. No. 215,386
Claims priority, application Argentina, Jan. 5, 1971, 233326
Int. Cl. C10l *5/36, 5/40*
U.S. Cl. 44—14 **4 Claims**



1. A self-supporting, totally combustible unit, for use in counteracting the effects of frost, which comprises a solid combustible body with at least one open-ended passage passing therethrough longitudinally, said passage being communicated with one or more lower air inlet and circulating channels, said unit being characterized by the fact that said combustible body consists integrally of 132 percent of a combustible mixture which includes 100 percent of petroleum residual coal, 15 percent of a filler material chosen from the group consisting of vegetable cellulosic materials, sawdust, pulverized rubber and bakelite, an asphalt agglomerate, and a material selected from the group consisting of vinyl polychloride and polyethylene, the lower base of said combustible body being provided with the channels which, communicating with longitudinal vertical passage, extend towards and to the side of said combustable body to provide inlet openings.

3,883,318
HYDROGENATED ALKYL AROMATICS AS PETROLEUM DISTILLATE FUEL COLD FLOW IMPROVERS
Nicholas Feldman, Woodbridge, and Stephan Ilnyckyj, Maplewood, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.
Filed Aug. 24, 1972, Ser. No. 283,388
Int. Cl. C10l *1/20*
U.S. Cl. 44—62 **10 Claims**

1. A distillate petroleum fuel oil having at least a major proportion boiling in the range of about 250° to 700°F., improved in its flow properties by 0.01 to 3 wt. % of a flow improving hydrogenated alkyl aromatic fraction of an amorphous normally solid wax having a melting point in the range of about 80° to 200°F. and a molecular weight in the range of about 600 to about 3,000 obtained from a residual petroleum oil.

3,883,319
FIRE RESISTANT JET FUEL COMPOSITIONS
Richard L. Green, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Nov. 23, 1973, Ser. No. 418,532
Int. Cl. C10l *1/28, 1/24, 1/22*
U.S. Cl. 44—62 **3 Claims**

1. A jet fuel having improved fire resistance comprising a distilled liquid hydrocarbon fuel having an endpoint of at least 224°C. containing from about 0.001 to 10 percent of an elastomer, selected from the group consisting of fluorocarbon

rubber, chlorosulfonated polyethylene rubber, polysulfide rubber, silicon rubber, urethane rubber, nitrile rubber and acrylic rubber.

3,883,320

REDUCING DEPOSITS AND SMOKE FROM JET FUELS WITH ADDITIVES INCORPORATING AN AMMONIUM SALT

Joseph Stephan Strukl, Hickory Hills, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Dec. 7, 1972, Ser. No. 312,960

Int. Cl. C10l *1/14*

U.S. Cl. 44—68 **12 Claims**

1. An additive composition, suitable for inclusion in jet fuel to inhibit smoke formation and ash deposition, comprising:

a. from 67 to 95 parts by weight of manganese or iron, provided as an oil-soluble metal coordination compound selected from the group consisting of methyl cyclopentadienyl manganese tricarbonyl and tertiary amyl ferrocene;

b. from 5 to 33 parts by weight of an alkaline earth metal, provided as an oil-soluble compound, said metal being selected from the group consisting of magnesium, calcium and barium, and said compound being selected from the group consisting of carboxylates, petroleum sulfonates, alkyl aryl sulfonates, alkyl phenates and alkylphenol sulfides; and

c. from 2 to 20 parts by weight of ammonium ion per 100 parts by weight of total metals from (a) and (b), said ammonium ion being provided as an oil-soluble ammonium salt selected from the group consisting of carboxylates, petroleum sulfonates, alkyl benzene sulfonates and alkenyl succinates.

3,883,321

DEVICE FOR GASIFICATION OF SOLID FUELS

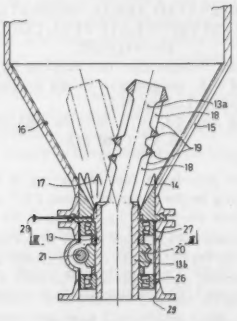
Wilhelm Haverkamp, Essen, Germany, assignor to Heinrich Koppers GmbH, Essen, Germany

Filed Oct. 17, 1973, Ser. No. 407,255

Claims priority, application Germany, Nov. 14, 1972, 2255694

Int. Cl. C10j *3/20*

U.S. Cl. 48—73 **9 Claims**



1. In a device for gasifying solid fuels, a combination comprising an upright vessel including an upper portion having an inlet for admission of solid fuel to be gasified and of an oxidant, a burner in said inlet, an outlet for discharging gasified fuel, and a bottom portion below said upper portion and having an interior surface circumferentially forming a downwardly conically converging bottom chamber having an axis and containing a liquid medium for entrapping slag formed in said upper portion during the gasification of the solid fuel; a tubular port downwardly of and coaxially merging with said bottom chamber and communicating therewith; comminuting means including a tubular member having a first portion accommodated in and coaxial with said tubular port, and a second portion inclined with respect to said first portion and situated in said bottom chamber proximate to said interior surface thereof and defining therewith a comminuting gap, said second portion being provided with at least one aperture connecting the interior of said tubular member with said bottom chamber for discharging slag particles below a predetermined size from said bottom chamber; and drive means for rotating said tubular member about the axis of said first portion thereof so that said second portion conically orbits about said axis with attendant orbiting of said comminuting gap, and cooperates with said interior surface to comminute the slag in said bottom chamber to said predetermined size.

3,883,322

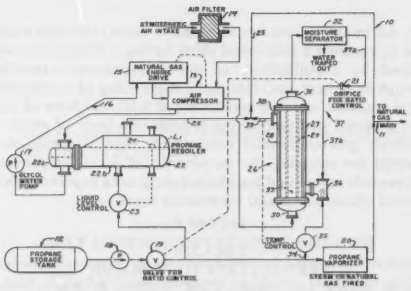
BLENDING APPARATUS FOR VAPORIZING PROPANE

Henry W. Bivins, Jr., 5030 Brummel, Skokie, Ill. 60076

Filed Aug. 23, 1973, Ser. No. 390,885

Int. Cl. B01f *3/02*

U.S. Cl. 48—180 A **17 Claims**



1. Apparatus for providing from a supply of liquefied fuel fluid a gaseous fuel fluid, comprising: delivery means; powered means for compressing ambient air; means providing a heat transfer coolant in heat exchange relationship with said powered means for cooling said powered means; means for providing heat exchange between the liquid fuel fluid and said coolant for cooling said coolant and vaporizing said liquid fuel fluid; and means for delivering to said delivery means a mixture of fuel fluid vaporized by said heat exchange means and air compressed by said powered means.

9. Apparatus for providing from a supply of liquefied fuel fluid an aerated gaseous fuel fluid, comprising: delivery means; means for providing compressed air; means for flashing the liquefied fuel fluid; means responsive to the flashing of the liquefied fuel fluid for dehumidifying the compressed air; and means for delivering a mixture of the dehumidified compressed air and the flashed fuel fluid to said delivery means.

3,883,323

WELDED RAILROAD RAIL GRINDING APPARATUS

Lush E. Cooley, 1835 Wilson Ave., Cleveland, Tenn. 37311

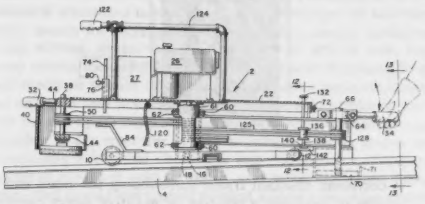
Filed Sept. 6, 1974, Ser. No. 503,852

Int. Cl. B23p *23/04*

U.S. Cl. 51—178 **12 Claims**

1. Apparatus for grinding welded joints between the rails of a railroad track comprising a chassis including a base assembly carrying a pair of longitudinally spaced rollers adapted to rest on one of the rails of the track and a laterally extending stabilizer arm carrying another roller adapted to rest on the opposite rail of the track, a platform mounted on said base assembly, a source of power mounted on said platform, at one end of said chassis a grinding element carried by said platform and rotatable by said power source about a normally vertical axis, means for tilting the axis of said grinding element from side to

side and also moving said grinding element vertically with respect to said base assembly so as to grind the top and side surfaces of the ball portion of a welded joint in the first mentioned rail, at the other end of said chassis two additional grinding elements carried by said platform rotatable by said power source about normally vertical axes and disposed on



opposite sides of the said first mentioned rail, and means for moving said additional grinding elements horizontally towards and away from one another and vertically with respect to said base assembly so as to grind the side surface of the web portion and the top surfaces and side edges of the base flange portion of said welded joint.

3,883,324

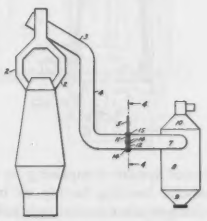
METHOD AND APPARATUS FOR AGGLOMERATING DRY DUST PARTICLES IN A GAS STREAM AND SEPARATION

Paul A. Balla, Bethlehem, and Charles C. Oshinski, Johnstown, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 72,931, Sept. 8, 1970, abandoned. This application May 2, 1973, Ser. No. 356,536

Int. Cl. B01d *45/12*

U.S. Cl. 55—1 **8 Claims**



1. A method for removing dry particulate material from a gas stream containing both fine and coarser particulates comprising:

a. passing the gas stream in a substantially dry state through a gas conduit and through a constriction in said conduit having a cross sectional area not greater than about one quarter of the cross sectional area of the conduit and located within the duct at least five duct diameters upstream from a dry dust collector and having a cross sectional area of the duct and the initial velocity through the duct of the gas stream such as to cause an abrupt increase in velocity of said gas stream at least 10,000 fpm as it passes through the constriction, and

b. passing the dry gas stream to said dry dust catcher where particles in the gas stream are removed in a dry state.

3,883,325

METHOD OF AND APPARATUS FOR THE RECOVERY OF SOLVENT GASES FROM AN AIR STREAM

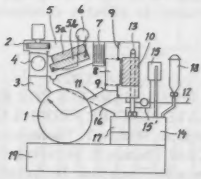
Heinrich Fuhring, Augsburg, and Johannes Helmut Sieber, Aystetten, both of Germany, assignors to Böwe Böhler & Weber Maschinenfabrik, Augsburg, Germany

Filed Mar. 21, 1973, Ser. No. 343,535

Claims priority, application Germany, Mar. 23, 1972, 2214153

Int. Cl. B01d *53/04*

U.S. Cl. 55—20 **10 Claims**



1. A method of recovering solvent from an air stream in a dry-cleaning machine containing vapors of the solvent in the presence of air moisture, comprising the steps of circulating said air stream along a path through said machine and into contact with goods to be dried therein; cooling said air stream at a first location along said path to condense condensible components therefrom; reheating said air stream at a second location along said path downstream of said first location to decrease the relative humidity of the air stream; and treating said air stream after the reheating thereof with a solvent adsorber at a third location along said path downstream of said second location.

3,883,326

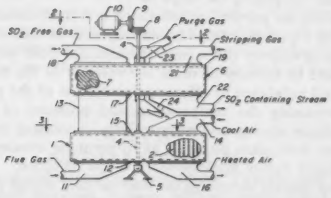
SULFUR OXIDES REMOVAL SYSTEM

John G. Wenner, Lincolnshire, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 239,893, March 31, 1972, Pat. No. 3,780,498. This application Dec. 17, 1973, Ser. No. 425,471

Int. Cl. B01d *53/06*

U.S. Cl. 55—34 **2 Claims**



1. A continuous method for simultaneously effecting the adsorption of sulfur oxides from a waste gas stream and the removal of such oxides which comprises maintaining the continuous rotation of a gas permeable cylinder-form bed of a SO_2 adsorbent material that has been divided into segmental zones by gas barrier means, a gas permeable rotating bed of heat exchange material being spaced from and utilized in a series flow combination with said rotating bed of SO_2 adsorbent material and providing a segmentally divided zone of heat exchange material in continuous rotation and in the flow path of said waste gas stream whereby such stream is first passed through said heat exchange material to effect a heating thereof prior to being passed into said bed of SO_2 adsorbent material, passing the waste gas stream from said heat exchange material continuously into contact with at least one

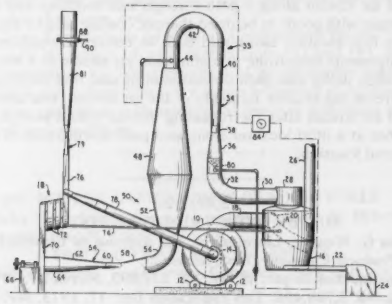
segmental zone of said bed and recovering from an opposing side of such zone a gas stream with reduced content of sulfur oxides, at the same time passing a regenerating gas stream through at least one segmental zone which has adsorbed sulfur oxides on said material to effect the substantial removal thereof, passing a high temperature gaseous stream into contact with said gas permeable rotating bed of heat exchange material through a portion of said rotating bed that is spaced from the pathway of the waste gas stream whereby the latter is heated and said high temperature gaseous stream is cooled down from contact with said heat exchange material, and continuing the rotation of said bed through said waste gas and regenerating streams to effect a continuing desulfurization operation.

3,883,327

METHOD AND APPARATUS FOR SEPARATING PARTICULATE MATTER FROM A GAS STREAM

Stanley P. Thompson; Walter T. Thompson; David L. Boyert, all of Topeka, and Thomas B. Swearingen, Manhattan, all of Kans., assignors to Thompson Dehydrating Company, Topeka, Kans.

Filed May 21, 1973, Ser. No. 362,440
Int. Cl. B01d *47/06*
U.S. Cl. 55—94 **17 Claims**



1. A method of combining a particulate substance with a substance which is initially present in a liquid state, said method comprising the steps of:

moving the particulate substance in a fluid stream; providing a quantity of said liquid substance in the fluid stream; progressively decreasing the internal fluid stream pressure to thereby increase the velocity of the particles of said substance to effect agglomeration of the particles;

maintaining the temperature and pressure of the fluid stream during said progressively decreasing step, above the saturation point so as to preclude condensation of liquid during agglomeration of the particles;

progressively increasing the internal fluid stream pressure to effect vaporization of said liquid substance; and

progressively reducing the internal pressure of said fluid stream to effect condensation of the vapor on the agglomerated particles.

3,883,328

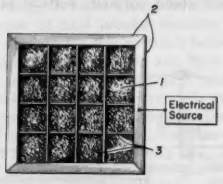
CARBON FIBER ELECTRODES FOR ELECTRICAL PRECIPITATORS

Raymond G. Spain, 4805 Metcalf Dr., Raleigh, N.C. 27612

Filed Nov. 29, 1973, Ser. No. 420,275
Int. Cl. B03c *3/40*
U.S. Cl. 55—154 **3 Claims**

1. A collecting electrode to remove particulate materials from gases by electrical precipitation comprising:

a mass of carbon fibers with an apparent density of 0.02 to 0.10 grams per cubic centimeter, with average individual fibers having an electrical resistivity of 2 to 13 × 10^{-4} ohm-centimeters, an axial fiber moduli greater than 10 × 10^6 psi, a density greater than 1.7 grams per cubic centimeter, and an equivalent diameter of 6 to 12 microns; and



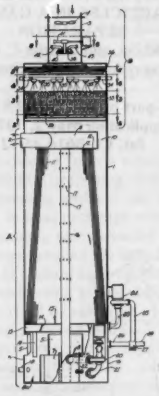
a corrosion resistant frame surrounding the mass and a means of applying a positive or negative direct current charge of at least 5000 volts to the carbon fiber mass and to provide mechanical support to the carbon fiber mass.

3,883,329

HIGH EFFICIENCY VAPOR CONTROL SYSTEM

John A. Dupps, Sr., Germantown, Ohio, assignor to The Dupps Company, Germantown, Ohio

Filed Jan. 23, 1974, Ser. No. 435,705
Int. Cl. B01d *47/06*
U.S. Cl. 55—222 **7 Claims**



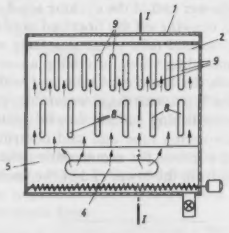
1. A vapor control system comprising an elongated, vertically disposed tubular housing having air inlet means at its bottom and air discharge means at its top, including blower means connected to said housing for creating an air stream flowing upwardly through said housing; a lower treatment zone comprising upper and lower spaced apart annular chambers mounted in said housing, an annular passage between said housing and said upper chamber, said lower chamber terminating inwardly in an annular wall defining a centrally disposed air flow passage, the said air stream flowing upwardly through the said passages, an annular array of condensing tubes interconnecting said upper and lower chambers and surrounding the air flow passage in the lower chamber, means for introducing odor containing vapors into said upper chamber, means for withdrawing condensate from said lower chamber, means for withdrawing non-condensables from said lower chamber, conduit means connected to the means for withdrawing noncondensables from said lower chamber and to the housing for introducing the non-condensables into the air stream beneath said lower chamber, and first spray means in said housing positioned to spray liquid onto said annular array

of condensing tubes through the air stream; an upper treatment zone in said housing overlying said upper chamber comprising means for subjecting the air stream to a liquid chemical treatment, and means overlying the said liquid chemical treatment means for thereafter removing moisture from the air stream prior to its discharge from the system through said air discharge means; a reservoir underlying said lower annular chamber for collecting both residual liquid chemicals from the chemical treatment means and liquid discharged by said first spray means for recirculation, and conduit means, including pump means, connected to said reservoir and to said first spray means for pumping admixed liquid and chemicals from said reservoir to said first spray means; and a separate scrubber adjacent said housing, spray means in said scrubber, conduit means operatively connecting the spray means in said scrubber to the reservoir in said housing, metering means for introducing additional chemicals into the conduit supplying the spray means in said scrubber, said metering means being connected to said last named conduit and to a separate source of liquid chemicals, means connected to the means for withdrawing non-condensables from the lower chamber for diverting the non-condensables to said scrubber for passage therethrough, and means for withdrawing the non-condensables for said scrubber for delivery to an incinerating means.

3,883,330
POCKET FILTER APPARATUS

Adolf Margraf, Im Haberkamp 196, D 4961 Wendthagen, Germany

Filed Jan. 10, 1974, Ser. No. 432,165
Int. Cl. B01d *46/02*
U.S. Cl. 55—341 **6 Claims**

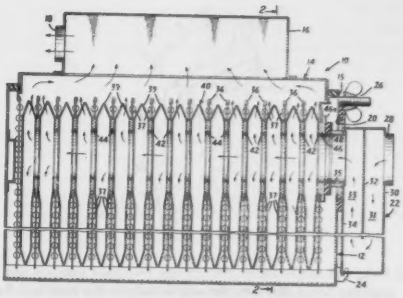


1. In a pocket filter apparatus including a housing structure defining an enclosure therein and having an apertured wall mounted within the housing dividing the enclosure into a first chamber for a dust-laden gas and a second chamber for a clean gas, and the housing structure defining an inlet port into the first chamber, an outlet port out of the second chamber, with the apertured wall defining through-apertures of communication between the first chamber and the second chamber, and having a plurality of separate filter pockets separately mounted extending into the first chamber from and at least one open-end of each filter pocket mounted in at least one of the through-apertures for all through-apertures thereby sealing the first chamber from the second chamber, the improvement being: said through-apertures and respective ones of said filter pockets mounted therein being spaced-apart from one another at predetermined greater distances from one another at locations in juxtaposition to said inlet port than remaining other ones of said filter pockets spaced-apart from one another.

3,883,331
FILTER, PARTICULARLY FOR SMOKE SOLIDS FILTRATION

Richard A. Bernard, Flossmoor, and Arthur A. Bernard, Beecher, both of Ill., assignors to Dover Corporation, Memphis, Tenn.

Filed Jan. 8, 1973, Ser. No. 321,939
Int. Cl. B01d *46/02*
U.S. Cl. 55—381 **12 Claims**



1. A filter for filtration of a gas to remove particulate material therefrom comprising a housing; a filter element supported in the housing, the filter element including a multiplicity of generally flat, closed envelopes of a material that is permeable to gas but capable of capturing particles entrained in the gas, an inlet opening in at least one of the envelopes of the filter element for admission of the gas to be filtered into the interior thereof, means communicating the interiors of the envelopes with each other for distribution of the gas to be filtered among the interiors of the several envelopes, and means joining the envelopes together with the faces thereof at least partly in generally adjacent relation; means for maintaining the major portions of the external surfaces of the walls of the envelopes in spaced relation to provide flow passages between adjacent envelopes of the filter element for the flow of filtered gas through and away from the spaces between the envelopes, said means for maintaining the adjacent envelopes in spaced relation including separator plates mounted in spaced relation in the housing, at least one separator plate being disposed between each adjacant pair of envelopes and having spaced-apart protuberances engageable by the respective walls of adjacent envelopes; and means for conducting gas to be filtered into the filter element through the inlet opening thereof.

3,883,332
PARTICLE SEPARATOR

Richard Penderell Llewelyn, Cheltenham, Victoria, and John Austin Hart, Burwood, Victoria, both of Australia, assignors to State Electricity Commission of Victoria, Melbourne, Victoria, Australia

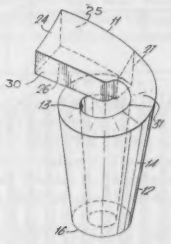
Filed Dec. 11, 1972, Ser. No. 314,165
Claims priority, application Australia, Dec. 9, 1971, 7328/71
Int. Cl. B01d *45/12*
U.S. Cl. 55—459 **3 Claims**

3. Apparatus for separating particles from a stream of gas and entrained particles, comprising:

an elongated annular duct having an outer tubular wall and an inner tubular wall both extending from an inlet end of the duct through to an outlet end of the duct; and

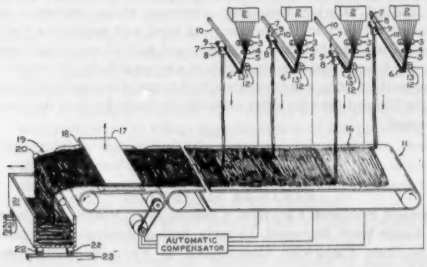
the inner and outer walls of the duct both converge conically toward a common convergence apex beyond the outlet end of the duct so that the duct is of contracting annular cross-section toward its outlet end;

an annular duct roof on the inlet end of the duct;
an inlet to the duct to direct the stream into the inlet end of the duct so that it flows with swirling motion through to an outlet end of the duct; and
outlet means to divide an inner part of the flow at the outlet end of the duct from particles in the outer region of the flow; wherein
said inlet has a roof, a floor, and inner and outer walls connecting the roof and floor so as to define a single inlet



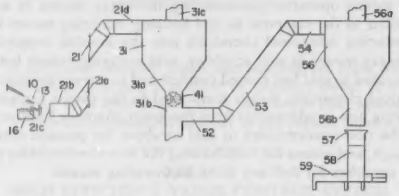
passage separate from the annular duct, the roof and floor of the inlet are non-parallel, and the roof of the inlet joins smoothly onto the roof of the duct which latter roof, after one revolution around the duct joins smoothly with the floor of the inlet at the entrance to the annular duct; and the inner and outer walls of the inlet converge in the direction of flow and smoothly join the inner and outer walls of the duct respectively, whereby at the entrance of the annular duct the flow in the inlet enters the duct smoothly.

3,883,333
METHOD AND APPARATUS FOR FORMING A UNIFORM GLASS FIBER CONTINUOUS MAT
Richard H. Ackley, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Oct. 25, 1973, Ser. No. 410,007
Int. Cl. C03b *37/00*
U.S. Cl. 65—2 **14 Claims**



4. A method of forming a continuous uniform density glass fiber mat comprising:
forming glass fibers from a plurality of fiber forming bushings;
depositing said glass fibers from said bushings onto a first continuous conveyor;
conveying said glass fibers from said first continuous conveyor to a second continuous conveyor;
adjusting the speed of said second conveyor, when at least one of said bushings is not operating and a strand deficient glass fiber mat is formed, to slow the speed of said second conveyor to allow for a uniform bulk density of said glass fibers to be conveyed onto said second conveyor, said bulk density being the same as when all of said bushings are operating; and
collecting the mat so formed.

3,883,334
MINERAL FIBER PRODUCTION METHOD AND APPARATUS
Don Cassidy, Martinsville, and Ray W. Barkhau, Indianapolis, both of Ind., assignors to L. C. Cassidy & Son, Inc., Indianapolis, Ind.
Filed May 23, 1974, Ser. No. 472,817
Int. Cl. C03b *37/06*
U.S. Cl. 65—2 **7 Claims**



1. A method of producing a homogeneous mineral fiber product from a stream of molten slag comprising: rectilinearly projecting and fiberizing the slag by entraining it in an annularly arranged array of steam jets; providing a collecting tube concentric with the annular array of steam jets for receiving the fiberized material with the open receiving end of the tube spaced from the point of entry of the slag into the steam flow and having a diameter somewhat less than the of the remainder of the tube to provide a conical entry section; connecting the end of said collecting tube remote from the entry section to an initial cyclone-type centrifugal separator; dropping the discharge from the lower end of the cyclone separator through an unloading valve; drawing off the fiberized material of lesser mass through a horizontal tube communicating with the discharge from the unloading valve; providing a conveying tube communicating with the horizontal tube and with the intake of a second cyclone-type centrifugal separator; providing air moving fans for establishing suction in said collecting tube, horizontal tube, conveying tube and said centrifugal separators; and providing a means for accumulating the homogeneous product issuing from the lower end of the second centrifugal separator.

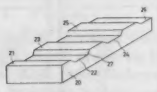
3,883,335
METHOD OF FORMING MICROCHANNEL PLATES HAVING CURVED MICROCHANNELS
Remy Henri Francois Polaert, Villecresnes, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 17, 1973, Ser. No. 361,287
Claims priority, application France, May 19, 1972, 72.18043
Int. Cl. C03c *23/20*
U.S. Cl. 65—4 **9 Claims**

1. A method of forming microchannel plates having curved microchannels extending between major faces thereof, for use in making secondary emissive electrodes, comprising the steps of:
forming a layer of substantially straight adjacent and parallel microchannels of the same cross-section, said layer being one microchannel thick;
positioning said layer between a first jig having parallel ribs and a second jig having ribs parallel to but positioned for interdigitation with said ribs of said first jig, with said microchannels crossing said ribs;
at a temperature where said microchannels are between their plastic phase and their elastic phase, pressing said

jigs toward each other to shape said microchannel layer to the contour of said jigs;

bonding said microchannels of said layer together;

stacking a multiplicity of similar so shaped and bonded microchannel layers;



bonding said stacked microchannel layers together; and

cutting said bonded stack of microchannel layers into plates along planes which intercept said microchannels of said bonded stack of microchannel layers.

3,883,336

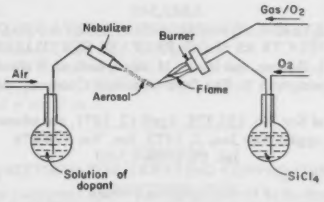
METHOD OF PRODUCING GLASS IN A FLAME

Eric N. Randall, Bath, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 11, 1974, Ser. No. 432,573

Int. Cl. C03b *23/20;* **C03c** *7/00;* **C03b** *25/00*

U.S. Cl. 65—18 **10 Claims**



1. A method for making a transparent, homogeneous glass body consisting of at least two constituent oxides comprising the steps:

a. entraining within a gas stream vapors of a compound of SiO_2, GeO_2, B_2O_3, P_2O_5, and SeO_2 that will hydrolyze in a flame to produce the corresponding glass forming oxide in particulate form;

b. nebulizing a solution containing a metal oxide or a metal compound thermally convertible by heat treatment in a flame to a stable metal oxide into an aerosol consisting of substantially uniformly-sized droplets that do not exceed about 10 microns in diameter; and

c. simultaneously passing said vapors and said aerosol into the flame of a combustion burner to form and codeposit a homogeneous oxide mixture as a glass body free from inclusions.

3,883,337

METHOD OF MANUFACTURING A GLASS OBJECT BY MOLDING AND SINTERING GLASS POWDER

Claes Ivar Helgesson, Akersberga; Sven Borje Stellan Persson, Taby, and Hans-Olof Ingvar Nilsson, Goteborg, all of Sweden, assignors to Stig Arbman AB, Stockholm, Sweden

Filed Apr. 18, 1973, Ser. No. 352,333

Claims priority, application Sweden, Feb. 6, 1973, 73016214

Int. Cl. C03c *15/00*

U.S. Cl. 65—31 **25 Claims**

1. In a method of manufacturing a glass object, wherein glass powder is molded and sintered, the improvement which comprises that, prior to the molding and sintering, the glass powder particles are coated with colloidal silica, said coating being effected by placing the glass powder in an alkaline silicate solution, thereupon acidifying the solution to a pH value at which colloidal silica precipitates, whereby said colloidal silica deposits on the surfaces of the glass particles, to coat the latter, and finally drying the coated glass powder.

9. In a method of manufacturing a glass object, wherein glass powder is molded and sintered, the improvement which comprises that, prior to the molding and sintering, the surfaces

of the powder particles are etched, whereupon the glass powder particles are coated with colloidal silica.

20. In a method of manufacturing a glass object, wherein glass powder is molded and sintered, the improvement which comprises that, prior to the molding and sintering, the surfaces of the glass powder particles are etched by treating the glass powder with an aqueous alkaline solution, whereby a quantity of glass is dissolved by the solution in the form of silicate, and acidifying the solution, whereupon said silicate deposits on the surfaces of the glass particles in the form of a colloidal silica coating.

3,883,338

PROCESS AND APPARATUS FOR THE PRODUCTION OF SHEET GLASS

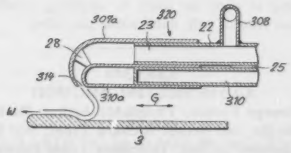
Valentin Stingelin, Aire/Geneve, Switzerland, assignor to Battelle Memorial Institute, Geneve, Switzerland

Continuation-in-part of Ser. No. 276,588, July 31, 1972, abandoned. This application June 5, 1974, Ser. No. 476,403

Claims priority, application Switzerland, Aug. 11, 1971, 11787/71

Int. Cl. C03b *18/02*

U.S. Cl. 65—91 **14 Claims**



1. A method of producing sheet glass of a thickness less than normal equilibrium thickness, comprising the steps of:

depositing a layer of molten glass on a predetermined surface area of a fluidic support;

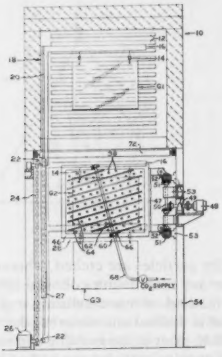
subjecting an intermediate portion of said layer to above-ambient gas pressure within boundaries defined by a descending gas curtain, thereby reducing the thickness of said intermediate portion with resulting broadening of said layer beyond its original width; and

expanding said gas curtain to widen said intermediate portion in step with the broadening of said layer while maintaining a surrounding marginal zone of equilibrium thickness.

3,883,339
METHOD OF TWO STAGE TEMPERING OF GLASS

Edmund R. Michalik, West Mifflin, and James E. Neely, Jr., Butler, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 7, 1974, Ser. No. 467,767
Int. Cl. C03b *27/00*
U.S. Cl. 65—114 **7 Claims**



1. In the method of tempering a glass sheet comprising heating said sheet to an elevated temperature range sufficiently high to impart a temper thereto on sudden chilling and applying cooling means sufficiently rapidly toward the surface of said glass sheet while at said elevated temperature range to produce at least a partial temper in said glass sheet, the improvement comprising

applying toward said glass sheet a cooling medium containing soft particles of a sublimable solid material having a sublimation temperature below the strain point of the glass and capable of sublimation on contact with a hot surface while said glass sheet is within said elevated temperature range and said soft particles are at a temperature not exceeding the temperature of sublimation of said material at a rate sufficient to develop a heat transfer coefficient of at least 100 British thermal units per hour per square foot per degree Fahrenheit at said heated surface to develop a compressive stress in the surface portion of the glass, and

continuing to cool the glass by applying another cooling medium free of soft, sublimable particles.

3,883,340
GLASS MELTING METHOD

William George French, Plainfield; Arthur David Pearson, Bernardsville, and Arthur Richard Tynes, Red Bank, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 29, 1973, Ser. No. 345,979
Int. Cl. C03b *5/00, 5/18*
U.S. Cl. 65—134 **3 Claims**

1. A method for the production of glass comprising;

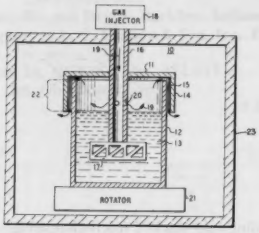
a. melting the constituents in a crucible to form a melt,

b. maintaining the melt at an elevated temperature with a controlled atmosphere above the melt, the crucible being situated in a furnace,

c. stirring the melt and

d. cooling the melt

characterized in that the controlled atmosphere is isolated from the furnace by the continual introduction of filtered gas of controlled composition into a partially enclosed chamber above the melt so that an outwardly flowing gas stream of linear velocity at least 10 feet per minute is maintained through a corridor at least one quarter of an inch long between the enclosed chamber and the furnace whereby the flow of contaminants from the furnace into the enclosed chamber is inhibited wherein



the partially enclosed chamber and corridor are formed by suspending a skirted lid above the crucible, which skirted lid has an inner diameter more than one percent larger than the outer diameter of the crucible and which skirted lid is suspended by means of a hollow tube extending through the lid, which hollow tube additionally serves to introduce the filtered gas into the partially enclosed chamber.

3,883,341
BIS-ALKYLENE PYROPHOSPHATE-UREA REACTION PRODUCTS AS SLOW-RELEASE FERTILIZERS

Cleve A. I. Goring, and Henry H. Scott, both of Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 133,375, April 12, 1971, abandoned. This application Jan. 2, 1973, Ser. No. 320,676
Int. Cl. C05b *15/00*
U.S. Cl. 71—29 **1 Claim**

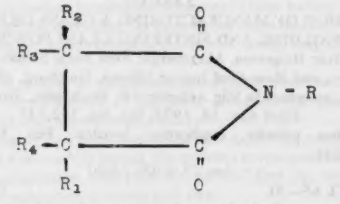
1. A method of fertilizing the soil which comprises applying to the soil a bis-ethylene pyrophosphate-urea condensation product prepared by the condensation of about 3 molecular equivalents of urea with about 1 molecular equivalent of bis-ethylene pyrophosphate.

3,883,342
PLANT GROWTH REGULATORS

Walter William Abramitis, Downers Grove, and John J. Callahan, Park Ridge, both of Ill., assignors to Akzona Incorporated, Asheville, N.C.

Filed Apr. 13, 1973, Ser. No. 350,854
Int. Cl. A01n *9/22*
U.S. Cl. 71—76 **6 Claims**

1. A method for increasing or decreasing plant growth comprising applying to the locus of a plant an effective amount of a regulant of the formula:



in which

R is alkyl having 8 to 22 carbon atoms;

R_1 is selected from the group consisting of hydrogen and alkenyl having 8 to 22 carbon atoms;

R_2, R_3 and R_4 are selected from the group consisting of hydrogen, methyl, and alkenyl having 8 to 22 carbon atoms:

and when R_1 is alkenyl, R_2, R_3 and R_4 are hydrogen.

3,883,343
METHOD OF TOBACCO SUCKER INHIBITION

Kanichi Fujikawa; Ryohei Takahashi; Isao Yokomichi; Fumio Kimura; Takeo Kaji, and Nobuyuki Sakashita, all of Kusatsu, Japan, assignors to Ishihara Sangyo Kaisha Ltd., Japan

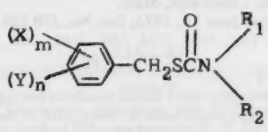
Filed Mar. 12, 1973, Ser. No. 340,534

Claims priority, application Japan, Mar. 13, 1972, 47-26016

Int. Cl. A01n *9/20*

U.S. Cl. 71—78 **5 Claims**

1. A method of inhibiting the growth of suckers of tobacco plants which comprises applying to tobacco plant, an effective amount benzylthiolcarbamate having the formula,



wherein

R_1 and R_2 are selected from the group consisting of acetyl, cyclohexyl, and C_{1-6} alkyl groups;

X and Y are selected from the group consisting of nitro, acetyl, amino, C_{1-3} alkyl, C_{1-3} alkoxyl, and halogen; and

m and *n* are 0 or 1.

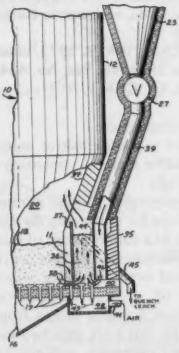
3,883,344
METHOD FOR TREATING COPPER ORE CONCENTRATES

William A. Griffith, Osburn, Idaho; Nicholas Tschischow, and Theodore S. Jordan, both of Casa Grande, Ariz., assignors to Hecla Mining Company, Wallace, Idaho

Filed Nov. 7, 1973, Ser. No. 413,652

Int. Cl. C22b *1/10, 15/00*

U.S. Cl. 75—1 **8 Claims**



1. The method of oxidizing metal solids containing copper compounds and other metal sulfides to product a calcine having the copper compounds in a readily leachable form and said other metal sulfides in a difficulty leachable form, comprising: maintaining said solids in a finely divided form in a loose, flowable main bed while contacting the solids with a supply of free oxygen and maintaining said bed at an elevated temperature of about 550°–750°C. to produce an oxidized bed comprising copper sulfate and gaseous reaction product mixed with entrapped fine solids; isolating said gaseous reaction products mixed with said fine solids from said main bed; separating said entrapped fine solids from said gaseous reaction products exteriorly of said main bed while maintaining an elevated temperature in said fine solids and then mixing said heated fine solids after said separating with a portion of the 550°–750°C. solids from said main bed to form a mixture of finely divided solids; maintaining said mixture of finely divided solids in a loose, flowable secondary bed while contacting the solids in said secondary bed with a separate supply of free oxygen substantially at the location where said mixing of said separated fine solids and said main bed portion occurs and maintaining said secondary bed at a roasting temperature of about 450°–750°C., said secondary bed temperature being not more than about 100°C. below that of said main bed to product a calcine rich in copper sulfate; and discharging said secondary bed calcine preparatory to recovering the copper content.

3,883,345
PROCESS FOR THE RECOVERY OF ANTIMONY

Frank R. Caldon; Joseph E. Pimentel, both of Arvada, and Clifford J. Lewis, Lakewood, all of Colo., assignors to National Lead Company, New York, N.Y.

Filed Aug. 10, 1971, Ser. No. 170,434

Int. Cl. C22b *31/00;* **C01g** *57/00*

U.S. Cl. 75—1 **40 Claims**

36. A process for the production of an alakli carbonate solution containing dissolved antimony therein, which comprises the steps of:

heat treating a mixture of an antimony-containing material and a carbon-containing material, said heat treatment being in the range of 800° to 1,000°C;

agitating said heat treated mixture in an aqueous solution of an alkali carbonate to result in an antimony-pregnant alkali carbonate solution and an insoluble residue;

separating said residue from said solution; and

further processing said solution for its antimony values.

3,883,346
NICKEL-LANTHANUM ALLOY PRODUCED BY A REDUCTION-DIFFUSION PROCESS

Donald L. Martin, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 345,559, March 28, 1973, abandoned. This application Apr. 25, 1974, Ser. No. 463,872

Int. Cl. B22f *9/00;* **C22c** *19/00*

U.S. Cl. 75—.5 BA **1 Claim**

1. A hydrogen storage medium consisting essentially of particles substantially free of strain ranging in size from about 10 microns to 50 microns consisting essentially of nickel-lanthanum alloy having a composition within 15% by weight of the stoichiometric composition of the Ni_5La intermetallic compound and containing entrapped calcium in an amount ranging from a detectable amount up to about 0.4% by weight of said alloy, said calcium being unremovable without melting said particles.

3,883,347

SLAG-FORMING AGENT FOR STEELMAKING

Masaru Takashima, Tokyo, Japan, assignor to Aikoh Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 225,286, Feb. 10, 1972, abandoned. This application Sept. 27, 1973, Ser. No. 401,269
Claims priority, application Japan, Feb. 16, 1971, 46-6491
Int. Cl. C21c *5/54*
U.S. Cl. 75—30 7 Claims

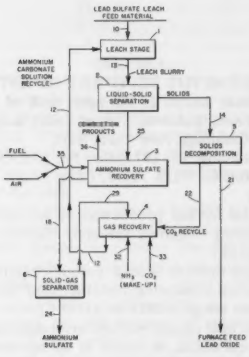
1. A method for making steel comprising adding to molten steel a slag-forming agent comprising 2 to 20% by weight of metallic titanium particles, 30 to 94% by weight of aluminum oxide, and 4 to 20% by weight of a binder.

3,883,348

PROCESS FOR THE REMOVAL OF SULFUR FROM BATTERY WRECKER MATERIAL USING AMMONIUM CARBONATE SOLUTION

Floyd A. Acoveno, and Thomas W. Freudiger, both of Dallas, Tex., assignors to R.S.R. Corporation, Dallas, Tex.

Filed Sept. 6, 1973, Ser. No. 394,837
Int. Cl. C22b *13/04*; C01g *21/02*, *21/14*
U.S. Cl. 75—103 10 Claims



1. A process for the recovery of more valuable products from lead sulfate bearing material, which comprises leaching said material with ammonium carbonate solution to form lead carbonate and ammonium sulfate, separating the effluent of the leaching step into a solid lead carbonate product and a liquid product comprising a solution of ammonium sulfate and carbon dioxide, recovering carbon dioxide from at least one of said products and reacting the same with ammonia to form ammonium carbonate, and supplying the latter in aqueous solution to the aforesaid leaching step.

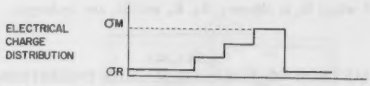
3,883,349

ELECTROPHOTOGRAPHIC CHARGING METHOD

Masamichi Sato, Tucson, Ariz., assignor to Rank Xerox, Ltd., London, England

Filed Feb. 22, 1973, Ser. No. 334,830
Int. Cl. G03g
U.S. Cl. 96—1 R 7 Claims

1. In an electrophotographic method of forming an image substantially free of background and highlight fog, wherein an electrostatic charge is applied to a photoreceptor surface, an image area of said charged surface is exposed to a light image to form a latent electrostatic image, and said exposed surface is then developed, the improvement which comprises charging a portion of said surface outside of said image area with an electrostatic charge greater than the first-mentioned charge,



and retaining the second-mentioned charge on said surface through at least a portion of the development.

3,883,350

PHOTOGRAPHIC PRODUCTS AND PROCESSES WITH SILVER COMPLEXES AS ANTIFOGGANTS

John C. Charkoudian, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 15, 1973, Ser. No. 370,220
Int. Cl. G03c *7/00*, *5/54*, *1/76*, *3/00*, *1/48*, *1/40*, *1/10*, *1/28*, *1/30*, *1/02*, *1/08*
U.S. Cl. 96—3 28 Claims

1. A photosensitive silver halide emulsion having associated therewith a stable, water-soluble compound of the formula:

$$AgL^{+2}\,2X^{-}$$

wherein L is a non-aromatic macrocyclic ligand having four electron donor atoms and is represented by the formula:

wherein each Y is a carbon chain of at least 2 carbon atoms and X is an anion.

3,883,351

METHOD OF MAKING A PHOTORESIST

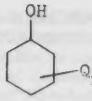
James M. Lewis, Aurora, Ohio, assignor to Horizons Incorporated, Cleveland, Ohio.

Division of Ser. No. 224,939, Feb. 9, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,540
Int. Cl. G03c *1/70*
U.S. Cl. 96—35.1 3 Claims

1. The process which comprises:

preparing a solution of a photosensitive material in a solvent, said photosensitive material consisting essentially of the following materials;

1. at least one polymerizable N-vinyl monomer;
2. at least one activator for enhancing the effect of exposing said monomer to a suitable dose of electromagnetic radiation at least sufficient to initiate polymerization of said monomer, said activator being selected from the group consisting of: organic halogen compounds in which at least three halogen atoms from the groups consisting of Cl, Br and I are attached to a single carbon atom; sulfonyl chlorides, sulfonyl bromides, sulfenyl chlorides, sulfenyl bromides and mercapto compounds wherein the mercapto group is attached to a carbon atom in a heterocyclic nucleus; and
3. at least one substituted phenol represented by the general formula



in which Q represents one or more hydroxyl groups, amino groups, alkyl or allyl groups and not all of the Q's need be the same, and *n* is an integer from 1 to 5; and

4. a resin which exhibits a good degree of solubility in an alkanol selected from the group consisting of methanol, ethanol and propanols and at least some solubility in the azeotrope of said alcohols and water;

coating the solution onto a solid substrate;

drying the coating;

photographically exposing the coating to suitable radiation; heating to complete polymerization of the exposed portions of the coating; and

developing the resulting resist with an alcohol or alcohol-water azeotrope.

3,883,352

PROCESS FOR FORMING A PHOTOCURED SOLDER RESIST

Harold A. Kloczewski, Pasadena, and William R. Schaeffer, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 348,378, April 5, 1973, abandoned, Division of Ser. No. 363,453, May 24, 1973, Pat. No. 3,824,109. This application May 3, 1974, Ser. No. 466,588

Int. Cl. G03c *5/00*

U.S. Cl. 96—35.1 **3 Claims**

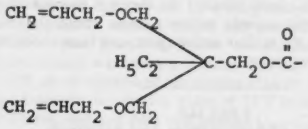
1. A process for forming a photocured solder resist on at least one surface of a substrate which comprises:

A. applying to said surface, a layer of a solid photocurable solder resist composition consisting essentially of:

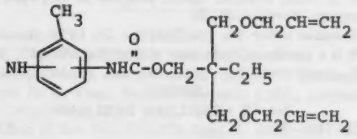
1. 5 to 40 parts by weight of a polythiol containing at least two thiol groups per molecule;

2. 60 to 95 parts by weight of poly-(diallyl orthophthalate), the sum of (1) and (2) being 100 parts by weight;

3. 1 to 20 parts by weight based on the weight of (1) and (2) of a liquid polyene of the formula:



and



4. 0.05 to 10 parts by weight based on the weight of (1) and (2) of a photocuring rate accelerator,

B. exposing said composition imagewise to actinic radiation for a time sufficient to insolubilize the exposed portion of said composition and

C. removing the unexposed photocurable composition from the surface of said substrate.

3,883,353

SPLICING OPTICAL FIBERS

Leonard George Cohen, Matawan; John Stone Cook, Summit, and Martin Victor Schneider, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 29, 1973, Ser. No. 364,500

Int. Cl. G03c *5/00, 11/00*

U.S. Cl. 96—38.3 **6 Claims**

1. A method for shaping the ends of first and second optical fibers that are to be spliced together, each of said fibers comprising a relatively high index-of-refraction cylindrical core having a relatively low index-of-refraction cladding disposed thereabout, said method comprising the steps of:

coating the entire end surfaces of said first and second fibers with negative and positive radiation-sensitive material, respectively,

exposing to radiation only a selected portion of the material coated on each of said end surfaces by directing at said material a radiant beam whose cross-sectional area approximates that of said core and is much less than the cross-sectional area of said core and cladding, said selected portion including the material covering the entire core area of each fiber end and excluding the major portion of the material that covers the cladding area of each fiber end,

removing the unexposed portion of said material from said first fiber end and the exposed portion of said material from said second fiber end,

and removing a longitudinal portion of each fiber end that is not protected by remaining material.

3,883,354

COLOR REVERSAL PROCESS AND DEVELOPER

Robert P. Molenda, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 188,616, Oct. 12, 1971. This application Aug. 14, 1972, Ser. No. 280,263

Int. Cl. G03c *5/50, 5/30*

U.S. Cl. 96—59 **32 Claims**

1. A bath for photographic positive color development of silver halide photographic elements, said bath comprising, in aqueous solution at a pH of from 8.5 to 14:

A. at least 0.02 moles/liter of photographic color developing agent capable, upon oxidation thereof, of reacting with a photographic coupler to form a dye; said color developing agent having a polarographic half-wave potential at pH 11.0 from about −159 to about −305 millivolts;

B. at least one black and white developing agent having a polarographic half-wave potential at pH 10.0 of from about −10 millivolts to about −187 millivolts; and

C. water-soluble, dye-formation inhibitor in a concentration of at least about 0.10 moles/liter which is present in sufficient quantity so that substantially all dye formation of a silver halide photographic element is restrained in said bath after said element has been exposed to light, the mole ratio of inhibitor to color developer being at least about 0.97.

15. A photographic color reversal development process which comprises

A. treating a color photographic element having a hydrophilic colloid silver halide layer bearing a latent image with an aqueous bath solution which includes at least 0.02 moles/liter of photographic color developing agent capable, upon oxidation, of reacting with a photographic color coupler to form a dye, black and white photographic developer including at least one black and white developing agent having a polarographic half-wave potential at pH 10.0 of from about −10 millivolts to about −187 millivolts, and water-soluble dye-formation inhibitor in a concentration of at least 0.10 moles/liter, said concentration being sufficient so that substantially all dye formation

of a silver halide photographic element is restrained in said bath after said element has been exposed to the light, the mole ratio of inhibitor to color developer being at least about 0.97, thereby to imbibe said silver halide layer with said bath solution and to develop solely a negative black and white image therein;

B. thereafter fogging said silver halide layer so as to render said layer developable in non-imaged areas;

C. without intermediate removal of said imbibed bath solution, treating said layer to reduce the inhibiting effect of said dye formation inhibitor; and

D. allowing development therein of a positive color image in the presence of a color coupler.

3,883,355

CRYSTALLIZATION OF SILVER HALIDE WITHIN AN AQUEOUS MIXTURE OF A WATER SOLUBLE SILVER COMPLEX AND A POLYMERIC COLLOID BINDER

Vivian K. Walworth, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 27, 1973, Ser. No. 383,106

Int. Cl. G03c *1/02;* **C03c** *1/08;* **G03c** *1/18*

U.S. Cl. 96—114 **18 Claims**

1. A method for forming a photographic silver halide emulsion layer which comprises mixing an aqueous solution of a water-soluble complex of silver halide complexed by excess halide and a polymeric binder material, forming a layer of said mixture and crystallizing photosensitive silver halide grains in said layer by decomplexation.

3,883,356

RINSE-WAX FORMULATION

Rudolf Syrovatka, and Kurt Hofer, both of Vienna, Austria, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 9, 1973, Ser. No. 349,165

Claims priority, application United Kingdom, Apr. 11, 1972, 16591/72

Int. Cl. C08h *9/00;* **C09d** *1/14*

U.S. Cl. 106—8 **5 Claims**

1. A rinse-wax formulation suitable for incorporation into rinse waters during the laundering of cars or automobiles, comprising an aqueous medium having therein solubilized a cationic surfactant selected from the group consisting of reaction products of long-chain fatty acids containing from 8–22 carbon atoms with alkylene polyamines, alkylolamines or ammonia, the condensation products of primary fatty amines containing from 8–22 carbon atoms with an alkylene oxide, the quaternary ammonium salts of fatty amines having at least one alkyl substituent containing from 8–22 carbon atoms; and mixtures thereof; a mineral oil having an aromatic material content of from about 15–70% by weight; and a non-alkalimetal salt of long chain fatty acids having from about 12–22 carbon atoms in the chain, selected from the group consisting of magnesium, calcium, strontium, barium, zinc, cadmium, aluminum salts and mixtures thereof; said formulation comprising essentially about 1–20% by weight of said cationic surfactant, about 10–30% by weight of said mineral oil, about 0.01–2.0% by weight of said non-alkalimetal soap, and the balance water.

3,883,357

LASER GLASS HOST COMPOSITIONS COMPRISING TEO_2, LA_2O_3 AND ZNO

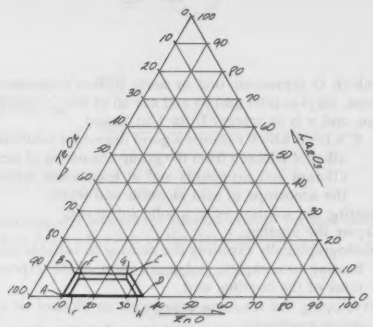
Richard F. Cooley, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 27, 1973, Ser. No. 374,229

Int. Cl. C03c *3/28*

U.S. Cl. 106—47 R **14 Claims**

1. A laser glass composition comprising TeO_2, La_2O_3 and ZnO, the proportions of TeO_2, La_2O_3 and ZnO in molar amounts being defined by the area within the heavy lines, connecting the points ABCD of the ternary diagram of the Figure, the laser glass composition including an effective



lasing amount of Nd_2O_3 for stimulated emission at a wavelength of about 1.06 microns.

3,883,358

COPPER ALUMINOBORATE GLASSES

Joseph W. Malmendier, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 22, 1974, Ser. No. 490,500

Int. Cl. C03c *3/14*

U.S. Cl. 106—47 R **3 Claims**

1. A copper-containing glass consisting essentially, by weight on the oxide basis wherein the copper content is expressed as CuO, of about 25–55% CuO, 0–25% Al_2O_3, and 40–70% B_2O_3.

3,883,359

REFRACTORY INSULATING COMPOSITIONS

Barry J. Harvey, Tydesley, England, assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,964

Int. Cl. C04b *35/02*

U.S. Cl. 106—64 **8 Claims**

1. A pumpable refractory insulating composition comprising from about 20 to about 50 percent of hydraulic setting cement, from about 10 to about 25 percent of finely divided refractory material, from about 1 to about 5 percent of a particulate synthetic organic polymer, from about 0.15 to about 0.3 percent of a surface active agent, and from about 20 to about 70 percent water.

3,883,360

GROUTING COMPOSITION AND METHOD

Alvaro L. Ruiz, Madrid, Spain, assignor to Hayward Baker Company, Northbrook, Ill.

Continuation of Ser. No. 102,265, Dec. 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 694,807, Jan. 2, 1968, abandoned. This application Oct. 25, 1972, Ser. No. 300,783

Int. Cl. C04b *35/16;* **E02d** *3/00*

U.S. Cl. 106—74 **5 Claims**

1. A grouting composition consisting, per liter of solution, of from 350 to 675 cc alkali metal silicate having an alkali metal oxide:silicon dioxide ratio of about 1:3 to 1:5 and having an alkali metal silicate solids content between 30 and 45 percent; from about 25 to 60 cc formamide; from 5 to 50 cc of ethyl acetate, and the balance water, said ethyl acetate being dissolved in said formamide and the combination of the formamide and ethyl acetate being present as a solute in said composition.

3,883,361

PORTLAND CEMENTS

Harry Wilfred Wallace Pollitt, Sevenoaks, and Arthur William Brown, London, both of England, assignors to The Associated Portland Cement Manufacturers Limited, London, England

Filed Oct. 4, 1973, Ser. No. 403,427

Claims priority, application United Kingdom, Oct. 11, 1972, 46875/72

Int. Cl. C04b *7/02*

U.S. Cl. 106—89 **10 Claims**

1. An expansive cement of the Portland type comprising a clinker ground to a specific surface of 250 – 550m²/kg and composed predominantly of alite with at least 2 percent by weight based on the clinker of free lime the major proportion of which is in the form of globular inclusions encapsulated within individual alite crystals.

3,883,362

FRIABLE COMPOSITIONS AND PROCESS FOR PRODUCING SAME

James E. Yates, and Paul H. Washecheck, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 425,378, Dec. 17, 1973, abandoned. This application May 1, 1974, Ser. No. 465,950

Int. Cl. C08h *9/06, 17/36*

U.S. Cl. 106—268 **14 Claims**

1. A process which comprises mixing a paraffinic hydrocarbon wax, calcium hydroxide and a fatty acid while heating to a temperature of at least 150°C and thereafter cooling to recover a solid, glass-like, friable composition, said paraffinic hydrocarbon wax having a drop melting point of at least 110°F, an oil content of not greater than 50 percent by weight and a needle penetration value (77°F) in the range of 1 mm to 20 mm, and said fatty acid being a C_{16}–C_{24} aliphatic hydrocarbon monocarboxylic acid or mixtures thereof.

3,883,363

FRIABLE COMPOSITION AND PROCESS

James E. Yates, Ponca City, Okla., and Wilfred M. Pinto, Mahtomedi, Minn., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 425,379, Dec. 17, 1973, abandoned. This application May 1, 1974, Ser. No. 465,789

Int. Cl. C08h *9/06, 17/36*

U.S. Cl. 106—268 **10 Claims**

1. A process which comprises mixing a paraffinic hydrocarbon wax and calcium salt of a fatty acid while heating to a temperature of at least 150°C and thereafter cooling to recover a solid, glass-like, friable composition, said paraffinic hydrocarbon wax having a drop melting point of at least 110°F, an oil content of not greater than 50 percent by weight and a needle penetration value at 77°F in the range of 1 mm to 20 mm, and said fatty acid being a C_{16}—C_{24} aliphatic hydrocarbon monocarboxylic acid or mixtures thereof.

3,883,364

ALKALINE EARTH CARBONATES

James A. Robertson, Levittown, Pa.; David W. Tunison, and Andrew O. C. Fong, both of Modesto, Calif., assignors to FMC Corporation, New York, N.Y.

Division of Ser. No. 286,478, Sept. 5, 1972, Pat. No. 3,802,901. This application Jan. 4, 1974, Ser. No. 430,766

Int. Cl. C09c *1/02*

U.S. Cl. 106—306 **5 Claims**

1. A dust free granular alkaline earth metal carbonate selected from the group consisting of barium and strontium carbonates, in physical form, suitable for feed stock in glass furnaces, the product being characterized by its graininess and particle hardness and capacity to be handled mechanically without generating fine dust, said product including as an intercrystalline sintering agent, dispersed through it an alkali metal silicate in an amount providing from 0.05 to 0.50 percent by weight of silicate (expressed as silicon dioxide) which is sintered into the total final composition.

3,883,365

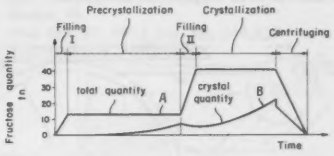
PH ADJUSTMENT IN FRUCTOSE CRYSTALLIZATION FOR INCREASED YIELD

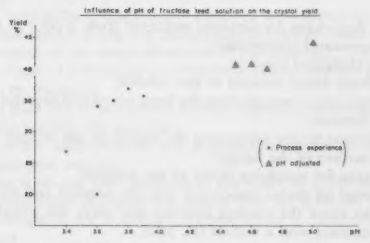
K. Holger Forsberg, Kotka; Lauri Hamalainen, Kantvik; Asko J. Melaja, Kantvik, and Jouko Johannes Virtanen, Kantvik, all of Finland, assignors to Suomen Sokeri Osakeyhtio, Helsinki, Finland

Continuation-in-part of Ser. No. 215,391, Jan. 4, 1972, abandoned. This application Jan. 28, 1974, Ser. No. 437,224

Int. Cl. C13f *1/02;* **C13k** *9/00*

U.S. Cl. 127—60 **13 Claims**





1. A method for crystallizing fructose from a water solution thereof containing glucose as an impurity which comprises the steps of

a. providing an aqueous fructose solution containing glucose as an impurity and at least about 90 percent dry substance, the fructose content of the dry substance being at least about 90 percent by weight,

b. adjusting the pH of the solution to within the range of 4.5 to 5.5,

c. bringing the aqueous fructose solution to a temperature at which it is saturated with respect to fructose,

d. adding fructose seed crystals to the solution,

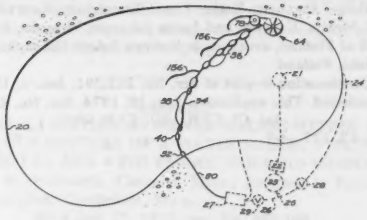
e. lowering the temperature of the resulting mass at a controlled rate to cause the mass to be supersaturated with respect to fructose and to bring about an increase in crystal size of the seed crystals without substantial formation of new fructose crystals, and

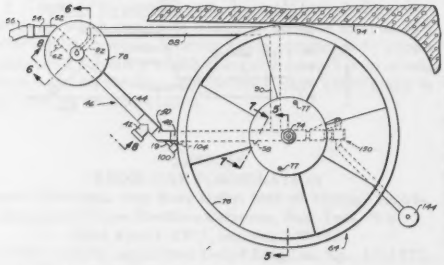
f. separating the fructose crystals from the mass when the crystal size is in the range of about 200 to 500 μm.

3,883,366
POOL CLEANER

Charles M. Blumenfeld, 4700 Parkridge Rd., Sacramento, Calif. 95822

Continuation-in-part of Ser. No. 221,942, Jan. 31, 1972, abandoned. This application July 27, 1973, Ser. No. 383,256
Int. Cl. B08b *3/02, 9/08*
U.S. Cl. 134—52 **25 Claims**





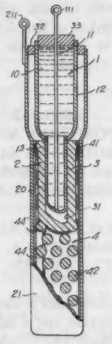
1. Apparatus for cleaning sediment from a pool of liquid, the apparatus comprising:
an elongated conduit;
a front wheel secured to the conduit;
a rear wheel spaced from the front wheel and secured to the conduit;
buoyant means supporting the wheels in the vicinity of the surface of the liquid;
means for supplying liquid to the conduit;
lateral jet means associated with the conduit and arranged to move the conduit laterally and carry the wheels into contact with a wall of the pool;
intermittent jet means associated with the conduit and arranged to move it longitudinally along the side of the pool;
means for opening and closing the intermittent jet means to cause the conduit to move along the wall in a stop-and-go pattern;
a downwardly extending flexible hose secured to the conduit for stirring up sediment in the pool; and
means for removing liquid from stirred-up sediment from the pool.

3,883,367
SODIUM-SULFUR STORAGE BATTERY

Takewo Chiku, Toyota; Takeshi Kogiso, Nagoya; Kimie Kojima, Toyota, and Takashi Yoshida, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya-shi, Japan

Filed Oct. 17, 1973, Ser. No. 407,197
Claims priority, application Japan, Oct. 19, 1972, 104797
Int. Cl. H01m *35/02*
U.S. Cl. 136—6 F **14 Claims**

1. A sodium-sulfur storage battery comprising in combination a battery container,
at least one negative half-cell unit within said battery container defining a sodium chamber,
molten sodium within said sodium chamber,
a negative conductor extending from within said sodium chamber,
at least one positive half-cell unit within said battery container defining a sulfur chamber,
molten sulfur within said sulfur chamber,
a positive conductor,

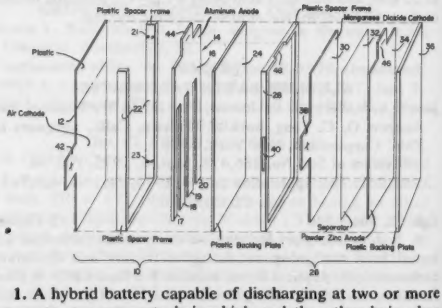


a solid electrolyte between said negative and positive half-cell units for separating said sodium chamber from said sulfur chamber and passing only sodium ions therethrough, and
a porous current collector mesh within said positive half-cell unit in electrical contact with said positive conductor and a surface of said solid electrolyte,
said porous current collector mesh being formed by interlacing carbon yarn composed of carbon monofilaments having an elastic modulus not less than 15 tons/mm² and a tensile strength not less than 100 kg/mm².

3,883,368
ALKALINE ALUMINUM-AIR/ZINC-MANGANESE DIOXIDE HYBRID BATTERY

Karl V. Kordesch, Lakewood, and Akiya Kozawa, Middleburg Heights, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 26, 1972, Ser. No. 301,108
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 A **9 Claims**



1. A hybrid battery capable of discharging at two or more current rates, one rate being high and the other being low relative to each other, said battery comprising a first and a

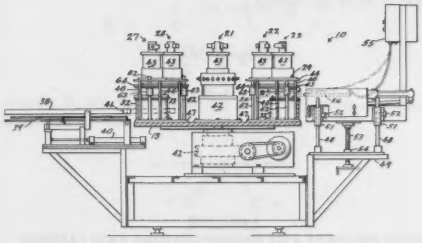
second cell electrically connected in parallel, the open circuit voltage of said first cell being substantially equal to the trickle charge voltage requirement of said second cell, said first cell having an aluminum electrode, an oxygen depolarized electrode, and an aqueous alkaline electrolyte, said aluminum electrode having a surface area such that the current density at said aluminum electrode at a current rate equal to the average current rate of said relatively high rate and said relatively low rate is sufficient to enable said first cell to be discharged without excessive wasteful corrosion of said aluminum electrode normally occurring at low current densities and without an excessive voltage drop in said first cell normally occuring at high current densities and said second cell having a zinc electrode, a manganese dioxide electrode, and an aqueous alkaline electrolyte, wherein said battery is so constructed and arranged that said first cell delivers most of the electrochemical output of the battery when the external discharge current rate on the battery is said relatively low rate, said second cell delivers most of the electrochemical output of the battery when the external discharge current rate on the battery is said relatively high rate, and said first cell charges said second cell when there is no external discharge current on said battery.

3,883,369

BATTERY ASSEMBLY MACHINE

John P. Badger, Genoa, and William H. Strater, Toledo, both of Ohio, assignors to Eltra Corporation, Toledo, Ohio

Filed Dec. 26, 1973, Ser. No. 427,737
Int. Cl. H01m *35/18;* B29c *19/02*
U.S. Cl. 136—176 **12 Claims**



1. An apparatus for heat sealing together a battery case and cover of a thermoplastic material, comprising, in combination, means for positioning a cover a predetermined distance above the upper surfaces of a battery case and for holding it in such position in alignment with and parallel to the opposed upper surfaces of said case, means for applying radiant heat to the spaced apart opposed surfaces of said cover and case until said surfaces become tacky, including means for adjusting the relative distances of the heat applying means from the cover and case, and means for joining and clamping together said case and cover for a predetermined period until said tacky surfaces become welded together.

3,883,370

ELECTRICAL BARRIER LAYER COATING AND METHOD FOR MAKING SAME

Jerome J. Kanter, 12300 Hobart Ave., Palos Park, Ill. 60464

Continuation-in-part of Ser. No. 105,650, Jan. 11, 1971, Pat. No. 3,700,505, which is a continuation-in-part of Ser. No. 828,707, May 28, 1969, abandoned. This application Aug. 11, 1972, Ser. No. 279,940The portion of the term of this patent subsequent to Oct. 24, 1989, has been disclaimed.
Int. Cl. B44d *1/18*
U.S. Cl. 148—6.35 **18 Claims**

1. In a process for providing an electrical barrier layer on magnetic inductors having an adherent oxide layer formed on a surface thereof, the steps comprising:

complexing said oxide layer of the magnetic inductor with at least one metal in solid phase from Group III of the Periodic Table by mechanical frictional contact therebetween in order to complex said Group III metal with said oxide layer;

said Group III metal selected from the group consisting of aluminum, scandium, yttrium, and the rare earth metals; said oxide layer formed by oxidation of said magnetic inductor metal;

said magnetic inductor comprising at least one metal from the spinel mineral group selected from the class consisting of iron, chromium, manganese, and the alloys thereof; and

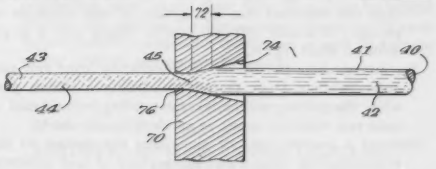
oxidizing at least a portion of said Group III metal contained in said layer.

3,883,371

TWIST DRAWN WIRE

Arthur L. Geary, Barrington, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Filed Feb. 21, 1973, Ser. No. 334,223
Int. Cl. C22c *41/00*
U.S. Cl. 148—32 **13 Claims**



1. An anisotropic wrought two-phase metal material comprising:

a. a cold deformed uniformly fiberized metallographic microstructure being in a helical angled configuration with respect to the longitudinal axis of the material;

b. at least 15 percent of one of the two phases being present in the material;

c. at least one of the phases present appearing as elongated fibers within the material;

and further characterized for a given reduction in cross-sectional area wherein:

1. the torsional yield strength of the material subjected to constriction and torsion is greater than the torsional yield strength of the material subjected solely to constriction, and

2. the tensile yield strength of the material subjected solely to constriction is equal to or greater than the tensile yield strength of the material subjected to constriction and torsion.

3,883,372

METHOD OF MAKING A PLANAR GRADED CHANNEL MOS TRANSISTOR

Hung Chang Lin, Silver Spring, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 11, 1973, Ser. No. 378,291
Int. Cl. H01i *7/44*
U.S. Cl. 148—187 **3 Claims**

1. A method of making a planar metal oxide semiconductor field effect device having a relatively narrow channel region and a silicon gate, wherein the improvement comprises:

forming a relatively thin insulating layer of oxide approximately 1×10^3A thick over a semiconductor substrate of selected conductivity type;

forming a layer approximately 5×10^3A thick of polycrystalline silicon over said insulating layer;

forming a first layer of glass over said polycrystalline silicon layer to a thickness approximately 10×10^3A thereby

being substantially greater than the thickness of the insulating layer;

masking and etching through said glass and polysilicon layers to the surface of said silicon layer to form at least two spaced apart windows of predetermined area for source and drain regions, respectively;

masking an area greater than said predetermined area over said first glass layer at the location of and substantially aligned with at least one window of said at least two windows corresponding to said source region for insuring proper alignment of a subsequent double diffusion thereat and then etching the glass at said larger area and the insulating layer to the surface of said substrate at the location of said at least one window, said thickness of said first glass layer thereby preventing any etching of the polysilicon layer thereat;

diffusing a first conductivity type impurity dopant selected from the group consisting of boron, aluminum, gallium and indium through said at least one window into the surface of said substrate;

removing the remainder of said first glass layer and any remaining insulating layer at the location of the other window;

simultaneously diffusing a second conductivity type impurity dopant selected from the group consisting of phosphorous, arsenic, antimony and bismuth through said at least two windows into the surface of said substrate to produce a double diffused source region and a single diffused drain region;

the intermediate portion of said insulating layer and said polycrystalline layer thereby producing a silicon gate while the polycrystalline layer extending beyond said at least two windows serves as an electrostatic shield;

forming a second layer of glass over the surface of the polycrystalline silicon and the surface of said substrate exposed by said at least two windows;

etching contact windows through said second layer of glass to the surface of said substrate at the source and drain regions and the surface of the silicon gate; and

forming a layer of metallization therethrough and etching a selected pattern for forming discrete metal electrodes.

3,883,373

GAS GENERATING COMPOSITIONS

Eric William Sidebottom, Otterburn Heights, Quebec, Canada, assignor to Canadian Industries Limited, Montreal, Quebec, Canada

Filed July 2, 1973, Ser. No. 375,654

Claims priority, application United Kingdom, July 24, 1972, 34481/72

Int. Cl. C06b *19/02*

U.S. Cl. 149—6 **8 Claims**

1. A gas generating composition comprising a mixture of particles of the following ingredients

1. an alkali metal azide or an alkaline earth metal azide,

2. an oxidizing compound in proportion sufficient to react completely with said azide with the liberation of nitrogen therefrom, and

3. an oxide selected from the group consisting of silicon dioxide, aluminum oxide, titanium dioxide, tin oxide and zinc oxide, with or without admixture with a metal selected from the group consisting of silicon, aluminum, tin and zinc, said oxide and metal being in proportion sufficient to react with all the metallic residue of the reaction between (1) and (2).

3,883,374

DOUBLE-BASE PROPELLANT CONTAINING ORGANIC AZIDE

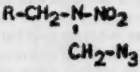
Ronald Rosher, Cumberland, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 851,765, Aug. 20, 1969. This application Apr. 26, 1972, Ser. No. 249,444

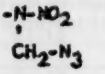
Int. Cl. C06d *5/06*

U.S. Cl. 149—19.8 **11 Claims**

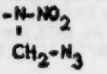
1. A propellant composition comprising nitrocellulose and an organic azide represented by the formula



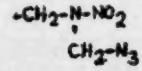
wherein R is selected from the group consisting of H, alkyl of 1 to 6 carbon atoms,



and alkyl of 1 to 6 carbon atoms wherein at least one hydrogen atom has been replaced by the



radical to form the radical



3,883,375

SOLID PROPELLANT COMPOSITIONS CONTAINING POLYMERIC BINDERS WITH AZIRIDINYL CURING AGENTS

Edmund J. Mastrolia, Sacramento; Charles B. Frost, Fair Oaks, and Gerald A. Wessler, Rancho Cordova, all of Calif., assignors to Aerojet - General Corporation, Azusa, Calif.

Filed Feb. 3, 1964, Ser. No. 343,446

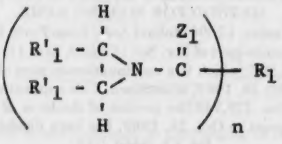
Int. Cl. C06d *5/06*

U.S. Cl. 149—19.9 **13 Claims**

1. A high energy propellant composition comprising an oxidizer and the reaction product of a terminally reactive polymer having the formula:

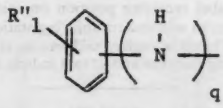
$$A_3(Y_3)_p$$

wherein A_3 comprises a polymer of a polymerizable vinylidene compound; Y_3 is selected from the group consisting of carboxy, hydroxy, amine and mercapto, and p is an integer of at least 2; with a curing agent selected from the group consisting of those having the formula:

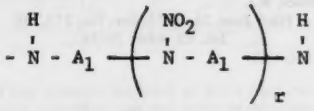


wherein R_1 is selected from the group consisting of alkylene, arylene, trivalent organic radicals of the formula:

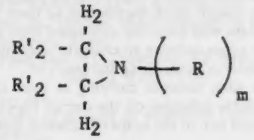
organic radicals of the formula:



wherein q is an integer of from 2 to 3 and R''_1 is selected from the group consisting of hydrogen and lower alkyl; and divalent radicals of the formula:

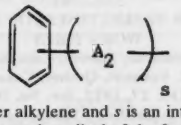


wherein A_1 is alkylene, and r is selected from the group consisting of 0 and 1; n is an integer of from 2 to about 4 and corresponds numerically to the valence of R_1; R'_1 is selected from the group consisting of hydrogen and lower alkyl and Z_1 is selected from the group consisting of oxygen and sulfur; and those having the formula:

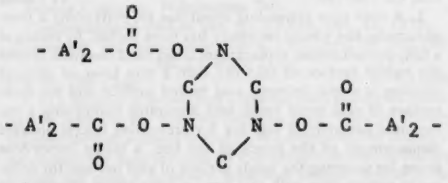


wherein R_2 is selected from the group consisting of alkylene, arylene, a trivalent radical of the formula:

a radical of the formula:



wherein A_2 is lower alkylene and s is an integer of from 2 to 3; and a trivalent organic radical of the formula:



wherein A'_2 is lower alkylene; m is an integer of from 2 to about 4, and corresponds numerically to the valence of R_2, and R'_2 is selected from the group consisting of hydrogen and lower alkyl.

3,883,376

HIGH REACTIVITY FUELS FOR SUPERSONIC COMBUSTION RAMJETS

Frederick S. Billig, Rockville; James C. Pirkle, Jr., Wheaton, and Stephen E. Grenleski, Jr., Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 87,344, Nov. 5, 1970, abandoned. This application May 7, 1973, Ser. No. 357,748

Int. Cl. C10l *1/30*

U.S. Cl. 149—22 **2 Claims**

1. A fuel composition capable of ignition within the low residence times occurring in a supersonic ramjet combustion engine comprising:

a hydrocarbon selected from the group consisting of n-dodecane, methylcyclopentadiene dimer, and tetra-hydro methylcyclopentadiene dimer, the hydrocarbon being present in the fuel composition in a proportion equal to at least 50 percent and not more than 87.5 percent by weight thereof; and, a pyrophoric additive component selected from the group consisting of respective mixtures of trimethylaluminum and ethyldecaborane; trimethylaluminum and pentaborane; triethylaluminum, ethyldecaborane, and diethyldecaborane; and, trimethylaluminum, ethyldecaborane, and diethyldecaborane; the additive component being present in the fuel composition in a proportion equal to not more than 50 percent by weight thereof and wherein the first-named constituent of each mixed additive component constitutes at least 20 percent of the additive component by weight.

3,883,377

1-AZIDO-1,1-DINITROALKANES, USEFUL AS PROPELLANTS

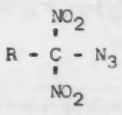
Charles M. Wright, Wilmington, Del., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 27, 1968, Ser. No. 780,614

Int. Cl. C06b *15/02;* **C07c** *117/00*

U.S. Cl. 149—88 **8 Claims**

1. A compound of the structure



wherein R is alkyl and contains up to eight carbons.

8. The method of plasticizing polynitropropene by adding to said polymer the compound of claim 1.

3,883,378

THERMALLY STABLE NITROSTARCH

Joseph S. Stack, Riverdale, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 23, 1966, Ser. No. 596,737

Int. Cl. C06b *9/04*

U.S. Cl. 149—108 **12 Claims**

1. A urethane complex consisting of the reaction product of nitrostarch and an isocyanate selected from the group consisting of

2,4-tolylene diisocyanate,
4,4'-diphenylmethane diisocyanate,
1,5-napthalene diisocyanate,
p-tolylene isocyanate,
3,3'-dimethoxy - 4,4'-biphenyl diisocyanate,
3,3'-dimethyl - 4,4'-biphenyl diisocyanate,

phenylene diisocyanate
hexamethylene diisocyanate, and
heptamethylene diisocyanate,
said complex having thermal stability above 65°C for use in munitions.

3,883,379

METHOD OF IMPROVING THE CORROSION RESISTANCE OF NICKEL-COPPER ALLOYS

Richard D. Tokarz, Ruhland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 21, 1972, Ser. No. 317,456
Int. Cl. C23f *1/00, 15/00*
U.S. Cl. 156—18 **2 Claims**

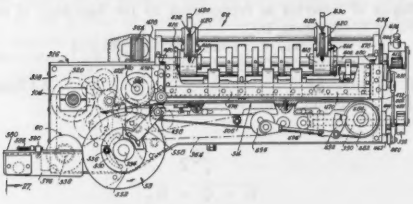
1. A method of improving the corrosion resistance to hot water of a resistance temperature detector including a body formed of a nickel-copper alloy containing 63–70 wt. percent nickel and minor amounts of sulfur, said alloy further containing magnesium residual from the forming process wherein it had been used as a deoxidizer, comprising etching the detector body in concentrated hydrochloric acid prior to exposure of the detector to hot water.

3,883,380

METHOD OF LABELING

Harry V. Kirk, Libertyville, and Manfred Rudy, Norridge, both of Ill., assignors to Kirk-Rudy, Inc., Kennesaw, Ga.

Division of Ser. No. 108,334, Jan. 21, 1970, abandoned, and a continuation of Ser. No. 234,980, March 15, 1972, abandoned. This application June 18, 1973, Ser. No. 370,824
Int. Cl. B32b *31/12;* **G05g** *15/00*
U.S. Cl. 156—60 **5 Claims**



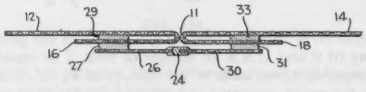
1. A method for applying indicia to each of a series of continuously moving articles at a preselected indicia receiving position thereon, said preselected position being at substantially the same relative position for each of said articles, said method comprising the steps of continuously moving each of said articles along a path of travel past an indicia applying station, moving a plurality of aligned labels in a row of labels along a second path of travel to said indicia applying station, engaging the leading edge of each of said moving articles during movement in said first path of travel for locating said preselected indicia receiving position at said indicia applying station, continuously rotating a label applying member in one direction while defining a label receiving position thereon, defining a nip in said second path of travel upstream of said label applying member, passing each label to said nip, temporarily stopping the movement of only the leading edge of said labels at said nip while remaining portions of each label continue movement thereby forming a kink in each of said labels, opening said nip to permit said label, including the temporarily stopped leading edge thereof, to continue movement in said second path of travel, positively feeding each of said labels thereafter to said label receiving position on said label applying member with the leading edge of each of said labels being positioned at the same relative position on said label receiving position on said label applying member, said positive feeding step also acting to remove said kink in said label and simultaneously causing said label to snap to a flattened position for substantially assuring complete separation of a leading label from an adjacent label, coinciding the timing of the rotation of said label applying member with the timing of the movement of each of said movably engaged articles for coinciding said label with said preselected indicia receiving position as said label receiving position on said label applying member rotates to said indicia applying station, and applying indicia on said labels to each of said articles at said preselected indicia receiving position and at said indicia applying station.

3,883,381

SLIDE FASTENER INSTALLATION AND METHOD AND SLIDE FASTENER PACKAGE FOR FORMING THE SAME

Bruce K. Thaeler, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Filed June 26, 1973, Ser. No. 373,705
Int. Cl. A44b *19/34*
U.S. Cl. 156—66 **5 Claims**



1. A method of installing a slide fastener having a pair of carrier tapes on an article, the article having a pair of main fabric sections folded upon themselves to form folded edges and a pair of flaps with each flap extending from a folded edge and the folded edges defining an elongate opening to be closed by the slide fastener comprising the steps of
providing a slide fastener carrying at least four strips of heat-bondable adhesive on the carrier tapes,
peeling at least two of the strips of adhesive from the carrier tapes,
disposing at least one of the peeled strips of adhesive between respective flaps and main sections for adhesively bonding the flaps and main sections and spacing the disposed strip of heat-bondable adhesive from the folded edges,
compressing the flaps against the main sections while applying heat to adhesively bond the flaps to the main sections, disposing a strip of heat-bondable adhesive between respective carrier tapes and flaps, and
compressing the carrier tapes against the flaps while applying heat to adhesively bond the carrier tapes to the flaps.

3,883,382

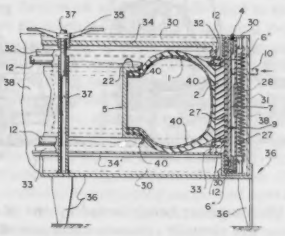
METHOD AND APPARATUSES FOR RETREADING WORN TIRES

Guy Pelletier, Melbourne, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada

Filed Oct. 27, 1972, Ser. No. 301,272
Claims priority, application Canada, Nov. 3, 1971, 126801
Int. Cl. B29h *5/04, 5/16*
U.S Cl. 156—96 **11 Claims**

1. A cold cure retreading apparatus for retreading a worn pneumatic tire whose periphery has been buffed, by means of a fully prevulcanized replacement tread band disposed around the buffed surface of said tire with a thin layer of uncured bonding material between said buffed surface and the inner surface of said tread band; said apparatus comprising a rim mounted centrally of said tire for preventing lateral outward displacement of the beads of the tire, a steam impervious lining for covering the inside surface of said tire and for defining in conjunction with said rim an inner steam chamber, an inner chamber steam supply means in communication with said inner steam chamber for feeding steam to said inner chamber, a peripheral belt for closely encircling the periphery of said tire with said tread band in place thereon, said belt

presenting a smooth bearing surface for contacting the outward surface of said tread band, a resilient ring disposed on each lateral edge of said tread band for inwardly pressing over the junctions between said tread band and the sides of said tire, means for retaining said resilient rings in place during



curing of said adhesive material, an outer rigid band circumscribing said peripheral belt and defining therewith an outer steam chamber for applying heat to the outward surface of said tread band during said curing, and outer chamber steam supply means in communication with said outer steam chamber for feeding steam to said outer steam chamber.

3,883,383

METHOD OF FABRICATING EMBOSSED MEMBRANES

Frank B. Leitz, Jr., Weston, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed Sept. 21, 1966, Ser. No. 580,914
Int. Cl. B29c *19/00*
U.S. Cl. 156—242 **12 Claims**

1. The method of making an embossed ion-exchange membrane comprising:

a. inserting a sheet of glass in a tray;
b. inserting polymerizable ion-exchange resin monomers in said tray to a predetermined height;
c. inserting a porous sheet of membrane-supporting backing material into said tray;
d. inserting a patterned sheet or plate of soft flexible metal into said tray, said sheet being provided with a flat marginal area;
e. inserting masking material on said flat marginal area;
f. inserting another glass sheet to rest on the surface of the masking material;
g. heating the tray and its contents for polymerization of the monomers therein;
h. and thereafter removing and separating the contents of the tray and peeling or stripping the said patterned sheet or plate from the resulting polymerized ion-exchange resin to obtain an embossed ion-exchange membrane.

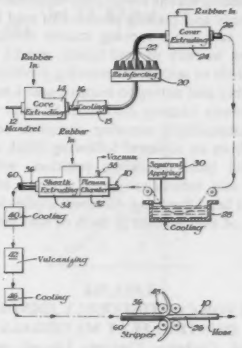
3,883,384

HOSE MANUFACTURE

Paul Hopkins, Hockessin, Del., assignor to Electric Hose & Rubber Company, Wilmington, Del.

Continuation-in-part of Ser. No. 83,096, Oct. 22, 1970, abandoned. This application Feb. 8, 1973, Ser. No. 330,703
Int. Cl. B29d *23/00*
U.S. Cl. 156—244 **1 Claim**

1. In a method of protecting a flexible hose during its manufacture wherein the hose includes an outer layer of readily deformable vulcanizable material, the improvement comprising passing the hose through an extruding machine, extruding around the hose a relatively thick soft flexible sheath made from a rubber material which lacks the necessary vulcanizing agents to render the sheath non-vulcanizable and reuseable, the sheath being extruded directly on the hose without any structural element therebetween, placing the hose carrying sheath in a steam autoclave by coiling a plurality of layers of the sheath carrying hose atop each other without any temporary wrapping as a means of protection, vulcanizing the hose with the use of heat and external pressure applied against both the sheath and the hose by utilizing the pressure developed in the steam autoclave to act against the external hose surface by being transmitted through the sheath, maintaining the sheath



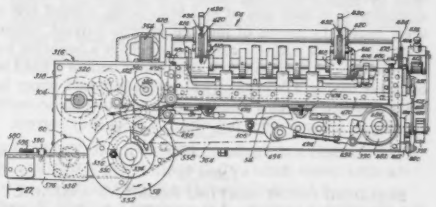
unvulcanized on the hose during vulcanization of the hose with the sheath remaining distinct and readily removable from the hose after vulcanization thereof, and removing the sheath from the hose after the hose has been vulcanized by the utilization of stripping elements which strip the sheath from the hose.

3,883,385

LABELING MACHINE

Harry V. Kirk, Libertyville, and Manfred Rudy, Norridge, both of Ill., assignors to Kirk-Rudy, Inc., Kennesaw, Ga.

Continuation of Ser. No. 108,334, Jan. 21, 1970, abandoned. This application June 19, 1973, Ser. No. 371,368
Int. Cl. B32b *31/12*; **G05g** *15/00*
U.S. Cl. 156—352 **8 Claims**



1. Apparatus for applying indicia to each of a plurality of continuously moving articles at a preselected indicia receiving position thereon, said preselected position being at substantially the same relative position for each of said articles, said apparatus comprising, in combination, an indicia applying station, means for continuously and successively moving each of said articles in a row along a first path of travel to and past said indicia applying station, means for continuously engaging the leading edge of each of said moving articles during movement thereof in said first path of travel for locating said preselected indicia receiving position at said indicia applying station, means for continuously and successively moving a plurality of labels in a row along a second path of travel to said indicia applying station, a label applying member at said indicia applying station and having a label receiving position thereon, means for continuously rotating said label applying

member, means for defining a nip in said second path of travel upstream of said label applying member, means for normally opening and temporarily closing said nip, each leading edge of each of said labels being temporarily stopped when said nip is closed and continuing movement in said second path of travel when said nip is open, each of said labels continuing movement in said second path to travel to said label applying member only after being temporarily stopped at said nip, said opening and closing means for said nip stops movement of said leading edge only and trailing portions of said label continue movement by said label moving means thereby forming a temporary kink in eack of said labels, means for delivering each of said labels to said label receiving position on said label applying member and acting to remove said kink in said label and simultaneously causing said label to snap to a flattened position for substantially assuring complete separation of a leading label from an adjacent following label, and means for coinciding said label receiving position, with said label thereon, with said indicia receiving position of each of said articles as said label applying member applies indicia on said labels to each of said articles at each of said indicia receiving positions.

3,883,386

APPARATUS FOR CONTINUOUSLY JOINING OR PAPER PRINTING FLAT MATERIALS

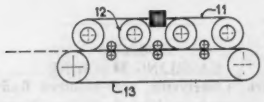
Eraldo Garbini, Corbetta; Umberto Lissoni, and Bruno Cislaghi, both of Magenta (Milan), all of Italy, assignors to Saer di Trezzi Edvige, Corbetta (Milan), Italy

Filed Mar. 20, 1972, Ser. No. 236,395

Claims priority, application Italy, May 25, 1971, 22240/71

Int. Cl. B29c *19/02*; **H05b** *5/00*, *9/02*

U.S. Cl. 156—380 **9 Claims**



1. An apparatus for continuously joining layers of fabric with interposed thermo-adhesive, comprising two continuous belts between which the parts to be joined are seized and compressed, at least one of said belts being a metal belt entirely heated by means of induced electric current, wherein the lower one of said two continuous belts is a conveyor belt, and the upper one of said two continuous belts is a fixed belt of metal having a low electrical resistance, said upper belt being disposed in such a manner as to constitute the secondary winding of a transformer fed with low frequency current.

3,883,387

BUILDING DRUM SHAPING SEGMENT ASSEMBLY

Geza M. Csatlos, P.O. Box 1411, Wadsworth, Ohio 44309

Filed Aug. 28, 1973, Ser. No. 392,334

Int. Cl. B29h *17/12*, *17/16*, *17/26*

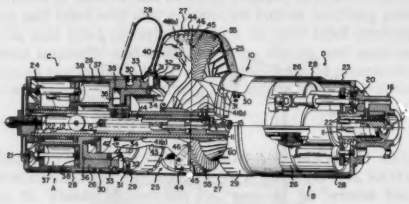
U.S. Cl. 156—415 **10 Claims**

1. A shaping segment assembly carried by a shaping mechanism used to radially expand the medial portion of a building drum having building surfaces provided by said medial portion said contractible end portions, said medial portion being overlaid by a cylindrical sleeve, said medial and end portions being mounted around a drum shaft,

said shaping mechanism including opposed axially movable actuator sleeves mounted around said drum shaft, each said actuator sleeve carrying the axially outer end of one of a pair of a series of control links positioned radially around said drum shaft, the axially inner end of each pair of control links being pivotally connected to a shaping segment carrier,

characterized in that,

said assembly has an alternating series of fixed and floating segments underlying and supporting said cylindrical sleeve as a building surface,



each said fixed segment being carried by one of the series of said carriers pivotally connected to a pair of said control links,

each said floating segment being connected adjacent the ends thereof to a fixed segment by a pair of continuous chains with pantographic links.

3,883,388

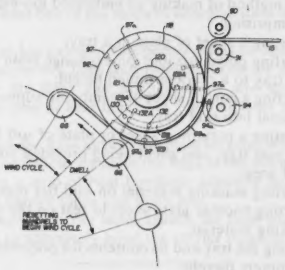
MACHINE FOR PRODUCING A PLASTIC-COVERED GLASS CONTAINER

Stephen W. Amberg, St. James; Thomas E. Doherty, Setauket, both of N.Y., and Clarence A. Heyne, Sun City, Ariz., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 209,751, Dec. 20, 1971, Pat. No. 3,802,942. This application July 11, 1973, Ser. No. 378,384

Int. Cl. B22b *1/00*

U.S. Cl. 156—446 **2 Claims**



1. A sleeve making machine comprising supply means for a web of material of predetermined width, a web feed device comprising counter rotating nip rolls rotated on parallel vertical shafts and through which the web is advanced, means connected to the vertical shafts for driving said nip rolls, a feed drum rotated on a vertical shaft, vacuum means on said feed drum for holding the advancing web thereon, means connected to the feed drum shaft for driving the drum at a surface velocity greater than the web velocity, the vacuum means providing a slip clutch effect for maintaining the web length between said nip rolls and feed roll in tension, a rotary knife mounted on a vertical shaft, means connected to said shaft for rotating it, said knife being engageable with the web on said drum for cutting sleeve lengths from said web, the cut length of web being spaced from the parent web on said drum, a mandrel turret machine having a circular array of rotatable mandrels thereon, the mandrels each being mounted on a rotatable vertical shaft, said turret being rotatable about a vertical axis and moving the surface of the mandrels successively in tangential proximity to the surface of the feed drum to a transfer station advanced beyond said rotary knife, drive means engageable with the vertical shafts of said mandrels at

the proximity of the transfer station and operable responsive to turret rotation for rotating the mandrels through a winding cycle in excess of one revolution, vacuum means on each mandrel for engaging the leading end of a sleeve length on the feed drum and transferring it to the mandrel, said sleeve length being wrapped around the mandrel in said winding cycle and overlapping the trailing end on said leading end, heat sealing devices on said turret individual to each mandrel, said devices each being operable in relation to the overlapped ends of a sleeve length wrapped around said mandrel for heat sealing them together, means on the turret connected to said devices for operating them in succession for heat sealing the overlapping ends of said wrapped length thereby forming it into a seamed sleeve, stripping means individual to each of said mandrels and supported by the turret for reciprocating stripping movement, said means at least partly encircling the mandrel adjacent an edge surface of a sleeve thereon, and means connected to the stripping means and operated responsive to rotary movement of the turret for axially shifting the sleeve on the mandrel.

3,883,389

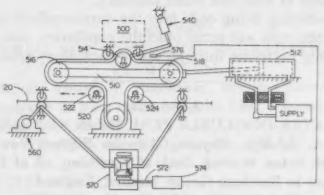
CONTINUOUS RECIPROCATING WEB DRIVE MEANS WORKING WITH INTERMITTENT HEAT SEAL FORMING MEANS

Charles M. Schott, Jr., Gloucester, Mass., assignor to Gloucester Engineering Co. Inc., Gloucester, Mass.

Division of Ser. No. 159,993, July 6, 1971, Pat. No. 3,775,225. This application Nov. 15, 1973, Ser. No. 415,956

Int. Cl. B30b *15/34*

U.S. Cl. 156—583 **1 Claim**



1. In a heat sealing machine operable on continuous plastic web, the machine including a pair of spaced shuttle rolls reciprocally movable in unison adjacent to a pair of more closely spaced idler rolls, said pairs of rolls adapted to have plastic web threaded thereabout, a drive means arranged to drive said shuttle rolls reciprocally to temporarily stop the plastic film, and a heat die for forming a heat seal in the stopped web located downstream, relative to the direction of normal web movement, of one of said shuttle rolls and wherein an endless timing belt is threaded about said pairs of rolls, and a single direction clutch is engaged with said belt, adapted to prevent said belt between said shuttle rolls and the portion of said film at said heat seal die from moving during the forming of the heat seal as said shuttle is driven in the take-up direction, the improvement wherein said single direction clutch is combined with a drive means for selectively rotating the normally stationary part of the clutch, said drive means energizable after a heat seal formation is made to cause movement of said endless belt and simultaneous movement of said film at said heat seal die away from said heat seal die despite continued normal web stopping movement of the shuttle and endless belt threaded thereabout against the single direction clutch.

3,883,390

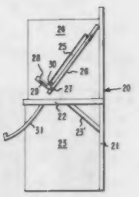
PROCESS AND APPARATUS FOR DELAMINATING AN ADHERENT RECEPTOR SHEET ON A SENSITIZED ELEMENT

Abraham B. Cohen, Springfield, and Herbert A. Tobias, East Brunswick, both of N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 201,414, Nov. 23, 1971, Pat. No. 3,794,546. This application Aug. 30, 1973, Ser. No. 393,053

Int. Cl. B32b *31/08*

U.S. Cl. 156—584 **6 Claims**



1. An apparatus for delaminating a receptor sheet from a discrete sheet structure comprising in combination:

a. a supply roll for a continuous web, said continuous web having an adhesive surface;

b. an element for feeding the sheet structure to said continuous web, said element including a track to move the sheet structure into position where it can be fed to said continuous web;

c. an element for adhering the adhesive surface of said continuous web to at least the leading edge of the receptor sheet by pressing the continuous web against the receptor sheet;

d. a heating element comprising at least one heating platen for heating said sheet structure before it is contacted by said continuous web; and

e. a take-up roll for said continuous web and the receptor sheet, said take-up roll being disposed relative to said element for adhering said continuous web to the receptor sheet so that upon take-up of said continuous web, the receptor sheet is delaminated from the sheet structure.

3,883,391

TREATMENT OF LIGNOCELLULOSIC MATERIAL WITH AN AQUEOUS CONTAINING CYANIDE IONS AND AN ALKALINE EARTH METAL SALT

Richard B. Phillips, Sloatsburg, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Jan. 16, 1974, Ser. No. 433,868

Int. Cl. D21c *3/02*

U.S. Cl. 162—70 **16 Claims**

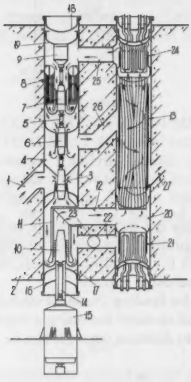
1. A process for increasing the yields of alkaline pulping of lignocellulosic material comprising treatment of the lignocellulosic material with an aqueous solution containing cyanide ions and a water-soluble, alkaline-earth metal salt.

9. A process for increasing the yields of alkaline pulping of lignocellulosic material comprising treatment of said lignocellulosic material with an aqueous solution containing cyanide ions and a water-soluble, alkaline-earth metal salt, removing the lignocellulosic material from said aqueous solution, and digesting the thus treated lignocellulosic material with an alkali-metal pulping solution having a pH above about 7 and up to about 12.

3,883,392
NUCLEAR REACTORS AND TO CLOSURE ARRANGEMENTS FOR USE THEREIN

Piotr Stanislaw Burylo, Leicester, and Dennis John Hughes, Nuneaton, both of England, assignors to The English Electric Company Limited, London, England

Filed Dec. 6, 1972, Ser. No. 312,669
Int. Cl. G21c *15/26*
U.S. Cl. 176—60 **4 Claims**



1. A nuclear reactor comprising:

A. a pressure vessel having a wall which defines a chamber accommodating a reactor core and arranged to contain gas under pressure,

B. means providing bores penetrating the wall of the pressure vessel from outside the vessel,

C. closure means for the bores,

D. means providing passages interconnecting the bores and the core chamber, and

E. turbomachinery housed within the bores and incorporating at least one heat exchanger and an associated water-box,

F. the closure means for the bore which houses a said heat exchanger of the turbomachinery comprising

i. a primary closure device which provides a gastight seal across the bore, and

ii. a secondary closure device extending across but not sealing the bore inwardly of the primary closure device to limit the escape of gas from the bore in the event of rupture of the primary closure device,

iii. the secondary closure device being provided by the said water-box, and

iv. the water-box comprising a pair of plates sealed together at their edges and shaped to provide a space between them, and

v. a partition separating the space into at least two chambers.

3,883,393
CELL CULTURE ON SEMI-PERMEABLE TUBULAR MEMBRANES

Richard A. Knazek; Pietro M. Gullino, both of Bethesda, Md.; Robert L. Dedrick, McLean, Va., and William R. Kidwell, Bethesda, Md., assignors to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 254,678, May 18, 1972, Pat. No. 3,821,087. This application Feb. 11, 1974, Ser. No. 441,445
Int. Cl. C12k *9/00*
U.S. Cl. 195—1.8 **5 Claims**

1. A method for the formation and maintanence of solid tissues in vitro comprising:

a. arranging a multiplicity of capillaries within a chamber simulating a vascular network, the capillaries having walls which are permeable to nutrients required for cell growth and/or cell products and being arranged with individual capillaries extending in substantially parallel relationship to each other within the chamber, dividing the chamber by the walls of the capillaries into an intracapillary space within the capillaries and an extracapillary spaced outside the capillaries, the intracapillary space and the extracapillary space communicating with each other only through the walls of the capillaries, the capillaries being spaced from each other so as to provide sufficient extracapillary space for three-dimensional growth of a large number of cells, with the capillaries being in sufficient proximity that when the depth of cell growth on one capillary is such that the cells growing on that capillary farthest from that capillary can no longer obtain nourishment from perfusate passing through that capillary and/or removal of waste products by perfusate passing through that capillary, such cells will be influenced by perfusate passing through at least one other capillary;

b. introducing living cells into the extracapillary space so that the cells will settle onto the capillaries; and

c. passing perfusate through the intracapillary space.

3,883,394
WATER-INSOLUBLE PENICILLIN ACYLASE

Thomas A. Savidge, Steyning; Lawson William Powell, and Kenneth Brian Warren, both of Worthing, all of England, assignors to Beecham Group Limited, England

Filed July 12, 1973, Ser. No. 378,697
Claims priority, application United Kingdom, July 22, 1972, 34411/72
Int. Cl. C07g *7/02*
U.S. Cl. 195—63 **13 Claims**

1. A process for the preparation of a water-insoluble enzyme preparation which comprises contacting in aqueous solution a water-insoluble absorbent material with a penicillin acylase enzyme, 0.1 to 10.0 millimoles of a water-soluble dialdehyde per gram of absorbent material and 0.1 to 5.0 millimoles of an aliphatic diamine per gram of absorbent material, the molar ratio of diamine to dialdehyde being from 1:1 to 1:10.

3,883,395
MEDIUM FOR THE CULTIVATION OF MYCOPLASMS

Rudolf Mauler, Cappel near Marburg Lahn, and Edgar Reichert, Marbach near Marburg Lahn, both of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg-/Lahn, Germany

Filed Mar. 13, 1973, Ser. No. 340,699
Claims priority, application Germany, Mar. 18, 1972, 2213240
Int. Cl. C12k *1/10*
U.S. Cl. 195—100 **9 Claims**

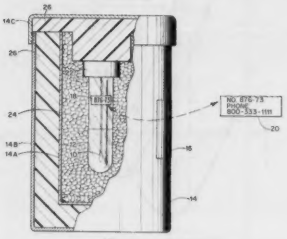
1. A medium for the cultivation of mycoplasms consisting essentially of an aqueous dispersion of glutamine or glutamic acid, valine, carbohydrate, yeast extract, an inorganic salt, and lecithin.

3,883,396

GONORRHEA DETECTING

Charles A. Thomas, Jr., Newton; James E. Zuckerman, Jr., Acton, and Stephen A. Morse, Brockton, all of Mass., assignors to Charles A. Thomas, Jr., Newton, Mass.

Filed Mar. 30, 1973, Ser. No. 346,415
Int. Cl. C12k 1/10
U.S. Cl. 195—100 8 Claims



1. A holding medium for *Neisseria gonorrhoeae*-suspect specimens comprising

a buffered saline solution, and

a non-nutritive concentration of secondary protein therein, ethanol, dissolved in the solution, and

progesterone, dissolved in the solution,

whereby gonococci if present in the medium, display an essentially flattened and extended colony-forming-unit versus time-curve.

3,883,397

MATERIAL FOR BIOLOGICAL DEGRADATION OF PETROLEUM

Philip McNair Townsley, Vancouver, British Columbia, Canada, assignor to John Dunn Agencies Ltd., Vancouver, British Columbia, Canada

Filed July 12, 1973, Ser. No. 378,647
Int. Cl. C12k 1/10
U.S. Cl. 195—100 6 Claims

1. A particulate material for promoting growth of petroleum degrading bacteria in oil slicks floating on water, each particle having:

a. a core of solid water soluable microbial available nutrient selected from the group consisting of nitrogen in the form of an ammonium compound, phosphorous in the form of a microbial available phosphate compound, and iron in a form of microbial available iron compound,

b. a coating encapsulating the core composed of a metalic salt of a fatty acid which is lipophylic, patially hydrophobic and biodegradable, the metal in the salt being selected from the group consisting of magnesium, aluminum and calcium.

3,883,398

MICROCULTURE SLIDE CHAMBER

Kazuyuki Ray Ono, Bridgeton, N.J., assignor to Belico Glass, Inc., Vineland, N.J.

Filed May 7, 1973, Ser. No. 357,991
Int. Cl. C12b 1/00
U.S. Cl. 195—127 10 Claims

1. A microculture slide chamber for growing cultures comprising:

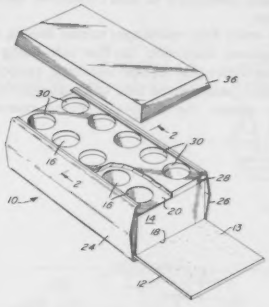
a slide on which said cultures are to be grown;

a matrix having a plurality of generally parallel matrix holes extending therethrough, said matrix being made of a resilient material;

said matrix holes when positioned over said slide defining a plurality of wells for containing a culture bearing fluid;

a gasket surrounding the end of each matrix hole adjacent said slide, each said gasket being integral with said matrix, and each said gasket providing a fluid-tight seal between said slide and said matrix for retaining fluid in said wells;

a plate having openings therethrough aligned to permit access to said matrix holes when said plate is in overlying relation to said matrix;



resilient clip means for retaining said microculture slide chamber in assembled relation for growing cultures therein, said assembled relation comprising said slide in abutting relation with the gasket side of said matrix and said plate in abutting and aligned relation with the opposite side of said matrix, and

a cover for said microculture slide chamber.

3,883,399

CHARGING COKE OVEN BLENDED COAL AND AN OVERLAY OF BRIQUETTES

Naomichi Nire, Takatsuki, Japan, assignor to Sumitomo Metal Industries Limited, Osaka City, Japan

Filed June 14, 1972, Ser. No. 262,672
Claims priority, application Japan, June 17, 1971, 46-43510
Int. Cl. C01b 47/10; C10b 57/04
U.S. Cl. 201—6 1 Claim

1. A method for carbonizing coal briquettes utilizing a conventional coking oven comprising:

charging said oven with a sufficient amount of a blended coal to fill the oven to a level within the range of between 70 and 94 percent of the effective height of the oven, said blended coal being capable of conversion into blast furnace coke upon carbonization thereof;

thereafter placing, on top of said blended coal, a sufficient amount of coal briquettes to fill the remainder of the effective height of the oven, said briquettes comprising an admixture of a soft coking coal and a non-coking carbonaceous substance; and

subjecting the contents of the oven to carbonization to thereby simultaneously produce blast furnace coke and coke briquettes.

3,883,400

SYSTEM FOR THERMAL DESALTING OF WATER

Ismail Zelfugarovich Makinsky, ulitsa E. Saratovtsa, 3/5, kv. 8; Enver Akhmedogly Kasimzade, ulitsa E. Saratovtsa, 5, kv. 21, and Samuil Petrovich Baksht, ulitsa Nizami 129 kv. 13, all of Baku, U.S.S.R.

Continuation of Ser. No. 311,643, Dec. 4, 1972, abandoned, which is a continuation of Ser. No. 117,982, Feb. 23, 1971, abandoned. This application Jan. 10, 1974, Ser. No. 432,156
Int. Cl. B01d 3/06, 3/10
U.S. Cl. 202—180 2 Claims

1. A system for thermal desalting of water comprising in combination:

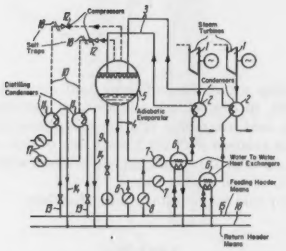
feeding and return header means for distributing cooling water in pipelines of the system;

at least one steam turbine having an exhaust for exhausting steam therefrom;

condenser means connected to the exhaust of said steam turbine through a pipeline;

an adiabatic evaporator having an inlet side and a first and second outlet side, said adiabatic evaporator having its inlet side connected to said condenser means through a pipeline;

water-to-water heat exchanger means having a first, second and separate third side, the first side being connected to the first outlet side of said adiabatic evaporator through a pipeline, said second side being connected to said condenser means, the third side being connected to said



feeding and return header means for distributing cooling water so that fluid flowing through said heat exchanger means from said first side to said second side is brought to the temperature of the cooling water in said distributing means;

said water-to-water heat exchanger means, said condenser means and said adiabatic evaporator forming a circulation water cooling system;

distilling condenser means connected through a pipeline to the second outlet side of said adiabatic evaporator for receiving steam therefrom, said distilling condenser means being connected to said feeding and return header means for distributing cooling water so that said condenser means is indirectly cooled thereby said distilling condenser means is cooled thereby.

3,883,401

PROCESS FOR THE SEPARATION OF KETAZINES FROM THEIR CRUDE SYNTHESIS MIXTURES

Jean-Pierre Schirmann, Brignais, and Marcel Thevenon, Pierre Benite, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

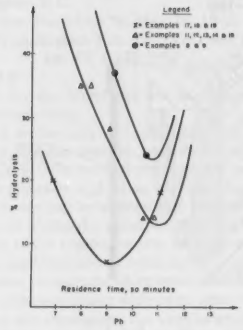
Filed Dec. 18, 1973, Ser. No. 425,865

Claims priority, application France, Dec. 21, 1972, 72.45576

Int. Cl. B01d *3/10*

U.S. Cl. 203—91 **3 Claims**

1. A method for the separation of ketazines from a crude synthesis mixture containing them which comprises adjusting the pH of the mixture to between about 8.5 and 12 by the addition of a base or an acid and distilling the crude reaction mixture during a period of 30 minutes or less at a reduced



pressure to maintain a distillation column base temperature not exceeding about 85°C.

3,883,402

PROCESS FOR ELECTROFORMING NICKEL CONTAINING DISPERSED THORIUM OXIDE PARTICLES THEREIN

Glenn A. Malone, Williamsville, N.Y., assignor to Textron Inc., Providence, R.I.

Continuation-in-part of Ser. No. 177,501, Sept. 2, 1971, abandoned. This application May 10, 1974, Ser. No. 468,877

Int. Cl. C23b *7/08, 7/00, 5/08*

U.S. Cl. 204—3 **19 Claims**

1. A method of electroforming dispersion strengthened nickel containing dispersed ultrafine thorium oxide particles, which electroformed nickel is of improved high temperature properties, which comprises passing a direct current between an anode and a cathode in an electroforming bath containing a dissolved nickel salt and 0.1 to 10%, on the basis of the dissolved nickel present, of thorium oxide particles of diameters in the range of 75 to 300 Angstroms, and at a pH in the range of 0.4 to 1.9, which electroforming bath contains ultrafine thorium oxide particles obtained by admixing a thorium oxide sol or a hydrated thorium oxide gel with an aqueous medium to produce a sol, so as to form on the cathode a deposit of nickel containing the dispersed ultrafine thorium oxide particles therein, which nickel deposit is mechanically deformable at room temperature and of improved high temperature strength compared to ordinary electroformed nickel.

3,883,403

APPARATUS AND METHOD FOR CATHODE STRIPPING

Victor Alexander Ettel, Mississauga, Ontario; Christopher Charles Dunkley, Sudbury, Ontario; Jose Antonio Blanco, Welland, Ontario, and Robert Ray Matthews, Lively, Ontario, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Oct. 4, 1973, Ser. No. 403,466

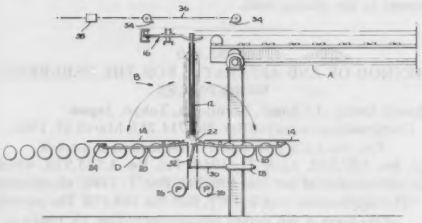
Claims priority, application Canada, Oct. 10, 1972, 153595

Int. Cl. C23b *7/02;* **B01k** *1/00*

U.S. Cl. 204—12 **14 Claims**

4. A process for electrodepositing a non-ferrous metal on a cathode blank and subsequently stripping the electrodeposit from the cathode blank which comprises electrodepositing a non-ferrous metal on a cathode blank in an electrolytic cell, said cathode blank and electrodeposit having different coeffi-

cients of thermal expansion, and said electrolytic cell containing an electrolyte that is maintained at a predetermined temperature, to form a cathode comprising the cathode blank and an electrodeposit of a preselected thickness thereon of at least about one-sixteenth inch thickness, removing the cathode from the electrolytic cell, conveying the cathode to a stripping station while maintaining the temperature of the cathode at



substantially the predetermined temperature to minimize premature parting, engaging the electrodeposit in the stripping station with gripping means affixed to mechanical stripping means, rapidly altering the temperature of the engaged electrodeposit to part at least partially the electrodeposit from the cathode blank at an edge and then actuating the stripping means to strip the parted electrodeposit from the cathode blank.

3,883,404

METHOD FOR MAKING SULFUR DIOXIDE-TREATED ASPHALT BINDERS

Pier Luigi Bocca, and Pierpaolo Pacor, both of Rome, Italy, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 23, 1973, Ser. No. 408,833
Claims priority, application Italy, Oct. 23, 1972, 53550/72
Int. Cl. C10c *3/02*
U.S. Cl. 208—44 **8 Claims**

1. A process for the production of a binding and coating agent which comprises contacting, in the liquid phase, an aromatic extract of a lubricating oil distillate fraction with a gas containing from 5 to 100 wt. % of sulphur dioxide, said contacting being conducted at approximately atmospheric pressure, and a temperature within the range of 180° to 650°C., at a ratio of feed of SO_2 per hour of from 0.5 to 10 liters (at S.T.P.) per kilogram of said aromatic extract, said contacting being sufficient to increase the sulphur content of the aromatic extract by from 0.75 to 12 percent by weight.

3,883,405

ZINC PLATING BATHS

Gerald H. Grossblatt, 3041 Hudson Ct., Chamblee, Ga. 30033

Filed July 10, 1972, Ser. No. 270,185
Int. Cl. C23b *5/10, 5/46*
U.S. Cl. 204—55 Y **12 Claims**

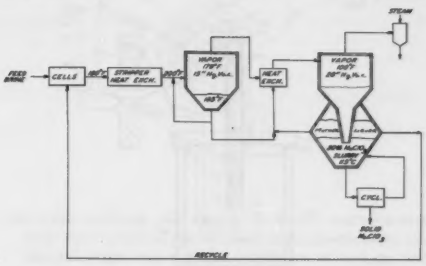
1. An aqueous, alkaline zinc cyanide electroplating bath containing as brightening agents, the polyamine-dialdehyde condensation products prepared by reacting at least one aliphatic dialdehyde with at least one polyamine salt of a water-soluble acid at temperatures and for a time sufficient to form said reaction products, said polyamine of said polyamine salt being a water soluble aliphatic compound having at least two terminal amine groups, said aliphatic dialdehyde being water soluble and having two terminal aldehyde groups, and said polyamine-dialdehyde condensation products present in sufficient amounts to improve the brightening of the plated products and characterized by solubility in said alkaline zinc cyanide bath.

3,883,406

PROCESS FOR RECOVERING ELECTROLYTICALLY PRODUCED ALKALI METAL CHLORATES

Thomas Francis O'Brien, Swarthmore, Pa., and Jimmie Ray Hodges, Benton, Ky., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed July 6, 1973, Ser. No. 376,978
Int. Cl. C01b *11/26*
U.S. Cl. 204—95 **5 Claims**



1. A method for electrolytically producing alkali metal chlorate from an alkali metal chloride comprising the steps of:
a. electrolyzing an aqueous sodium chloride solution at a temperature above about 50° C until an unsaturated cell liquor is produced having a sodium chlorate to sodium chloride ratio of between 5:1 and 27:1, the concentration of the sodium chloride component being maintained in the range between a lower level above about 30 grams per liter and an upper level below which sodium chloride cannot crystallize,
b. withdrawing the electrolyzed liquor from the cell as effluent and while above 50° C subjecting the effluent to evaporative concentration under reduced pressure and at constant temperature to effect crystallization of pure sodium chlorate crystals from the liquor, and
c. separating the pure sodium chlorate crystals from the liquor.

3,883,407

PRODUCTION OF 2,2,2-TRIFLUOROACETYL CHLORIDE

Albert L. Dittman, Allendale, N.J., assignor to Halocarbon Products Corporation, Hackensack, N.J.

Filed Apr. 20, 1973, Ser. No. 353,025
Int. Cl. B01j *1/10*
U.S. Cl. 204—158 R **5 Claims**

1. The process for the production of trifluoroacetylchloride which comprises reacting gaseous 1,1-dichloro-2,2,2-trifluoroethane containing less than about 0.1% of water by weight with a gas consisting essentially of oxygen at a temperature up to about 250°C in the presence of ultraviolet radiation thereby to produce trifluoroacetyl chloride containing less than about 5% of trifluoroacetic acid.

3,883,408

FURNACE ATMOSPHERE OXYGEN ANALYSIS APPARATUS

Yong-Wu Kim, Munster, and John P. Douglas, Schereville, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

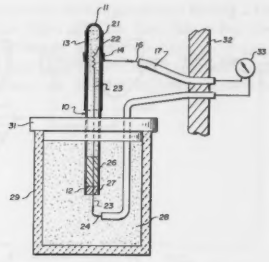
Division of Ser. No. 249,876, May 3, 1972, abandoned. This application Jan. 28, 1974, Ser. No. 437,214
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 S **5 Claims**

1. An oxygen-ion conducting galvanic cell comprising:
an elongated, hollow probe having one open end and having an exterior surface and an interior surface, said probe being made of an oxygen-ion conducting solid electrolyte;
a mixture of finely divided iron and a finely divided oxide thereof, said mixture being compacted in said hollow probe;

a hermetic seal associated with said open end comprising a finely divided, electrically nonconducting inert refractory solid material contained within said probe adjacent said mixture;

mechanical seal means for holding said hermetic seal in position adjacent said mixture;

a first electrical conductor making electrical contact with the exterior surface of said probe;



a second electrical conductor passing through said hermetic seal and making electrical contact with said mixture, said second conductor being electrically insulated from the exterior surface of said probe; and

insulating means including a bed of finely divided, electrically non-conductive refractory sand for insulating the point of entry of said second conductor into its associated hermetic seal from the exterior surface of said probe, said point of entry being embedded in said bed of refractory sand.

3,883,409

GOLD ALLOY ELECTROPLATING BATH

Andre Olivier, Rue Dufour, Switzerland, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed July 9, 1973, Ser. No. 377,471

Claims priority, application Switzerland, July 10, 1972, 10332/72

Int. Cl. C23b *5/42, 5/46*

U.S. Cl. 204—44 **28 Claims**

1. In an improved aqueous bath for the electrolytic deposition of gold or gold alloys on electrically conductive objects, said bath containing at least one chelating agent, an alkali metal gold sulfite, at least one gold alloying metal, and about 0.5–100 g/l of at least one electrically conductive salt other than said alkali metal goid sulfite, said gold alloying metal and said chelating agent, the improvement wherein white gold is deposited on said object and wherein said at least one gold alloying metal is at least one water soluble salt of cadmium, at least one water soluble salt of copper, at least water soluble salt of nickel, and additionally there is incorporated in said bath an organic phosphorus compound of either

a. a compound of the formula

$$R^{1}_{(3-n)} - N\left[-R - \overset{O}{\overset{\|}{P}} - (OH)_2 \right]_n$$

in which R^1 is a hydrogen atom or about a $C_1 - C_6$ lower alkyl radical, R is about a $C_1 - C_6$ alkylene radical, and n is a whole number of about 1 – 3; or

b. an alkylene diamino tetra-(methylphosphonic acid) or a 1-hydroxyalkylidene-1,1-diphosphonic acid, the alkylene and alkylidene groups of which contain about 1–12 carbon atoms, or

c. a water soluble salt of compounds of a or b;

said bath having a pH of about 8.5 – 11, and further wherein said bath contains gold in an amount of about 1 – 8 g/l, cadmium in an amount of about 0.1 – 30 g/l, copper in an amount of about 0.001 – 0.5 g/l, nickel in an amount of about 0.001 – 10 g/l and the organic phosphorous compounds in an amount of about 0.01 – 10 g/l; wherein said at least one chelating agent is other than a, b and c and is present in an amount sufficient to substantially completely complex all of the metals present in the plating bath.

3,883,410

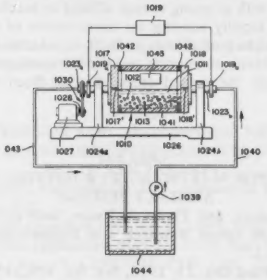
METHOD OF AND APPARATUS FOR THE DEBURRING WORKPIECES

Kiyoshi Inoue, 3 Chome, Kamiyoga, Tokyo, Japan

Continuation-in-part of Ser. No. 714,252, March 19, 1968, Pat. No. 3,620,953, and a Continuation-in-part of Ser. No. 859,532, April 21, 1969, Pat. No. 3,533,928, which is a continuation of Ser. No. 598,391, Dec. 1, 1966, abandoned. This application Aug. 2, 1971, Ser. No. 168,173. The portion of the term of this patent subsequent to Oct. 13, 1988 has been disclaimed.

Int. Cl. B23p *1/04*

U.S. Cl. 204—129.46 **1 Claim**



1. The method of removing burrs from a workpiece, comprising the steps of:

supporting said workpiece in conducting relationship with a source of electric current, said workpiece being the anode in a direct current circuit;

submerging said workpiece in a tank containing conductive abrasive media immersed in a conductive solution, said solution being an electrolyte solution; and simultaneously passing a direct electric current through said workpiece and said conductive abrasive media and conductive solution, to release atomic oxygen on the burr surface and to form an oxide coating on the surface of the burrs, and

vibrating said workpiece relative to said solution and said abrasive conductive media for providing random contact between said burrs and said conductive abrasive media to wipe off said burrs.

3,883,411

ELECTRODEPOSITION OF THICK NICKEL DEPOSITS ON PERMANENT CATHODE BLANKS

Aubrey Stewart Gendron, and Victor Alexander Ettel, both of Mississauga, Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 459,883

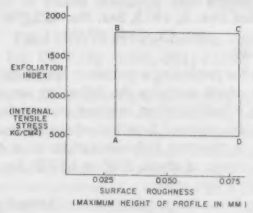
Claims priority, application Canada, Feb. 8, 1974, 192114

Int. Cl. C23b *7/02;* **B01k** *1/00;* **C22d** *1/14*

U.S. Cl. 204—12 **8 Claims**

1. A process for electro-deposition of nickel comprising electrodepositing substantially sulfur-free nickel continuous over an area of at least about 1 square decimeter to a thickness of at least about 1 millimeter on an abrasively roughened, permanent mandrel made of titanium, aluminum or stainless steel from an aqueous sulfate bath substantially devoid of

chloride and having a pH in the range of about 1.5 to about 5.5 under conditions whereby the Exfoliation Index of the deposit is correlated to the surface roughness of the mandrel



so as to provide adhesion during electrodeposition and ready removal of the deposit from the mandrel upon completion of the electrodeposition.

3,883,412

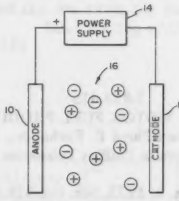
DESALINATION PROCESS

Richard E. Jensen, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1974, Ser. No. 438,089

Int. Cl. C02c *5/12;* **C02b** *1/82;* **B01k** *3/08*

U.S. Cl. 204—149 **2 Claims**



1. A method of removing ions from water comprising the steps of:

applying a low level positive voltage to a porous anode submerged in said water to form a space charge layer of negative ions in and around said porous anode;

applying a low level negative voltage to a porous cathode submerged in said water to form a space charge layer of positive ions in and around said porous cathode.

separating said anode and said cathode from said water so as to remove said positive and negative ions from said water;

combining ionized water with said porous anode and said porous cathode

removing said low level positive and negative voltages from said porous anode and cathode respectively

using low level voltages generated by said anode and said cathode to further deionize water.

3,883,413

OZONE GENERATOR USING PULSED ELECTRON BEAM AND DECAYING ELECTRIC FIELD

Diarmaid H. Douglas-Hamilton, Boston, Mass., assignor to Avco Corporation, Everett, Mass.

Continuation-in-part of Ser. No. 291,823, Sept. 25, 1972, abandoned. This application May 20, 1974, Ser. No. 471,725

Int. Cl. C01b *13/00, 13/12*

U.S. Cl. 204—176 **3 Claims**

1. A method of generating ozone comprising the steps of:

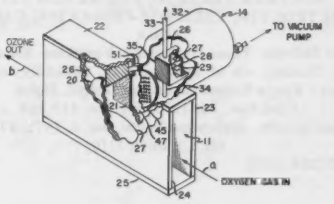
providing a supply of pressurized oxygen gas;

generating a controllable beam of high energy electrons;

producing a controllable electric field;

passing said gas through said field;

irradiating said gas in said field with short bursts of said high energy electrons; and



thereafter reducing said electric field after each electron burst by conduction through ionized gas produced by said electron burst until the next irradiation of said gas with said high energy electrons.

3,883,414

DETECTOR OF TRACE SUBSTANCE IN WATER

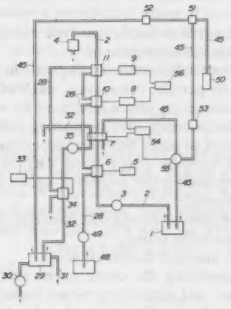
Taitiro Fujinaga, Kyoto, and Katuo Miura, Matsudo, both of Japan, assignors to Shibata Kagaku Kikai Kogyo Kabushiki, Tokyo, Japan

Filed Mar. 27, 1974, Ser. No. 455,326

Claims priority, application Japan, Mar. 28, 1973, 48-34679

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 R **13 Claims**



1. A detector system for detecting impurities in water, said system comprising:

a supply means for supplying supporting electrolyte;

b. first flow electrolyte cell means coupled to said supply means for purifying said supporting electrolyte, said first cell means including a casing and a potentiostat means;

c sample injector means including a sample reservoir coupled to said first cell means for injecting a sample containing said impurities into said system;

d at least two additional flow electrolyte cell means, including a second cell means coupled to said sample injector means and a third cell means coupled to said second cell means, said second and third cell means each including a casing and potentiostat means;

e depolarizer electrolyte supply means coupled to said casing of each of said cell means, wherein each said casing includes an auxiliary electrode and the depolarizer electrolyte flows through said casing to contact said auxiliary electrode; and,

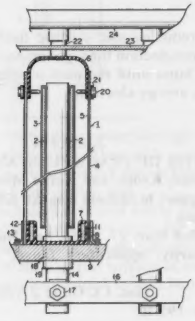
f recorder means coupled to the potentiostats of said at least two additonal cell means for recording the output thereof, the output of said potentiostats being indicative of the amount of said impurities in said sample.

3,883,415

MULTIPLE VERTICAL DIAPHRAGM TYPE ELECTROLYTIC CELL FOR PRODUCING CAUSTIC SODA

Hiroshi Shibata; Yasuo Yamazaki; Yoshikazu Kokubu, and Isao Okazaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1973, Ser. No. 419,864
Claims priority, application Japan, Dec. 4, 1972, 47-120718
Int. Cl. B01k *3/10*
U.S. Cl. 204—258 **7 Claims**



1. A multiple vertical diaphragm type electrolytic cell for producing caustic soda comprising:

a plurality of unit cells installed compactly in a cathode tank in electrically parallel connection, each of said unit cells including two anode plates interfixed by welding with at least two electroconductive supporting rods which in turn are connected to outer bus bars respectively,

an iron mesh cathode frame lined with an asbestos diaphragm surrounding the interfixed anode plates at a prescribed distance,

a cap made of corrosion-resistant material mounted on the iron mesh cathode frame,

a bottom dish inserted thereinto, and

means for supporting the outer upper side walls of said anode plates, said supporting means including a plurality of setscrews electrically insulated and held gas tight by a packing so as to prevent the rocking of the upper part of said anode plates.

3,883,416

STABILIZATION OF LUBE OIL

Tsoung Y. Yan, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,466
Int. Cl. C07c *27/10*
U.S. Cl. 208—3 **10 Claims**

1. A method for improving the oxidative stability of a hydrocarbon lubricating oil which comprises contacting said oil with a gas containing free oxygen and a solid basic refractory oxide catalyst characterized by an alkali metal content of between about 2 and about 30 percent by weight at a temperature in the range of about 150° to about 550°F., at a pressure between atmospheric and 500 psig and at a liquid hourly space velocity of between about 0.1 and about 10 volumes/volume of catalyst/hour.

3,883,417

TWO-STAGE SYNTHESIS OF LUBRICATING OIL

Charles Woo, Sarnia, Ontario, Canada; John A. Bichard, Baton Rouge, La., and Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 5, 1973, Ser. No. 422,096
Int. Cl. C10g *37/08*
U.S. Cl. 208—49 **6 Claims**

1. A process for preparing a synthetic lubricating oil of high viscosity index which includes the following steps:

a. subjecting a hydrocarbon mixture comprising alpha olefins within the range of 5-carbon-atom to 20-carbon-atom olefins to a thermal polymerization at a temperature within the range of about 300° to 650°F. for from 0.1 to 10 hours in a first zone;

b. separating from the product of the thermal polymerization a fraction comprising unreacted olefins having from 5 to 20 carbon atoms;

c. subjecting the last named olefin fraction to further thermal polymerization in a second zone at a temperature within the range of about 600° to 800°F. for from 0.1 to 20 hours; and

d. recovering a synthetic lubricating oil product from said second zone.

3,883,418

LEAD FREE MOTOR FUEL PRODUCTION

Lewis E. Drehman, and Floyd E. Farha, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 2, 1973, Ser. No. 320,501
Int. Cl. C10g *39/00*
U.S. Cl. 208—66 **6 Claims**

1. A method for upgrading a naphtha feedstock comprising: contacting said naphtha in a first reforming zone with a reforming catalyst under reforming conditions conducive to naphthene dehydrogenation with a minimum of paraffin conversion and separating from said first reforming zone a first liquid reformate stream comprising aromatics, unreacted paraffins and unreacted naphthenes;

separating said liquid reformate stream from said first reforming zone into a first fraction boiling below about 110°F, a second fraction boiling in the range of about 120° to about 260°F, and a third fraction boiling above about 260°F;

separating said second fraction boiling in the range of about 120° to about 260°F into a paraffin-rich raffinate and an aromatics-rich extract;

contacting said paraffin-rich raffinate in a second reforming zone in the presence of steam under reforming conditions with a catalyst consisting essentially of at least one Group VIII metal or metal compound capable of reduction, at least one tin group metal or metal compound, and at least one Group II metal aluminate or aluminate spinel support material; and separating from said second reforming zone a second liquid reformate stream; and

blending said first fraction having a boiling point below about 110°F, said third fraction boiling above about 260°F, said aromatics-rich extract and said second liquid reformate stream to form a gasoline fraction having an unleaded ASTM research octane number of at least about 95.

3,883,419

PROCESS FOR PREPARING PLATINUM-TIN REFORMING CATALYSTS AND USE THEREOF

Takuji Itoh, and Ikuo Akitsuki, both of Ohi-machi, Japan, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 17, 1973, Ser. No. 407,176
Int. Cl. C10g *35/08*; B01j *11/78*, *11/08*
U.S. Cl. 208—138 9 Claims

1. A process for preparing a hydrocarbon conversion catalyst comprising a complex compound of a platinum group metal component and a tin component contained on a refractory inorganic oxide carrier which comprises:

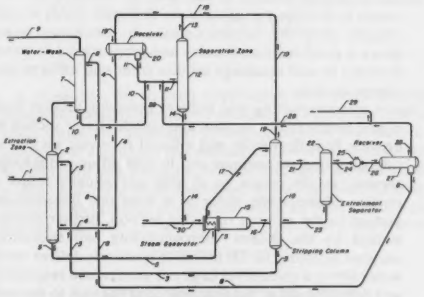
a. impregnating said refractory inorganic oxide carrier with an aqueous solution of a halogen acid containing a platinum group metal component;
b. drying the platinum group metal componentimpregnated carrier;
c. impregnating the dried platinum group metal component-impregnated carrier with a solution of a divalent tin compound, said impregnation conducted in a non-oxidizing and non-reducing atmosphere;
d. drying the carrier impregnated with said platinum group component and tin component; and
e. calcining the dried impregnate of step (d) at elevated temperatures.

3,883,420

EDIBLE OIL SOLVENT PRODUCTION

Richard D. Stone, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 30, 1974, Ser. No. 438,073
Int. Cl. C10g *21/28*
U.S. Cl. 208—321 8 Claims



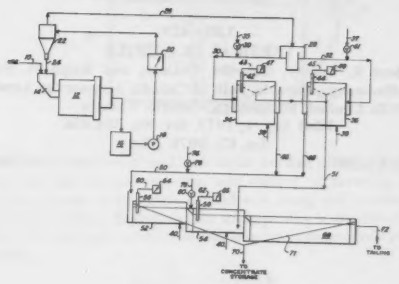
1. A process for removing aromatic hydrocarbons having more than eight carbon atoms per molecule from the extract phase from a solvent extraction zone, which process comprises countercurrently contacting said extract phase, containing (i) solvent, characteristically selective for dissolving aromatic hydrocarbons, (ii) aromatics containing less than nine carbon atoms per molecule and, (iii) aromatic hydrocarbons containing more than eight carbon atoms per molecule, with a mixture of steam and a lower molecular weight paraffinic hydrocarbon, containing from about three to about seven carbon atoms per molecule, the mole ratio of paraffin to steam in said mixture being in the range of about 0.1:1.0 to about 10.0:1.0, and recovering said solvent reduced in the concentration of aromatic hydrocarbons having more than eight carbon atoms per molecule.

3,883,421

MEASUREMENT OF OXIDATION REDUCTION POTENTIAL IN ORE BENEFICIATION

Dale Emerson Cutting, P.O. Box 717; Richard Arthur Womack, P.O. Box 265, and Joseph Vernon MacGuffie, P.O. Box 362, all of Cuba, N. Mex. 87013

Filed Sept. 12, 1972, Ser. No. 288,306
Int. Cl. B03d *1/02*
U.S. Cl. 209—1 20 Claims



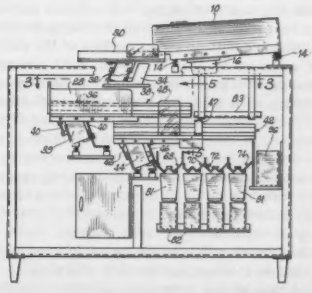
1. In a system for the beneficiation of an ore slurry over a range of compositions of the ore body from which said slurry was derived by addition to said slurry of a chemical substance of an oxidizing or reducing character including froth flotation agent and a flotation collector to improve the continuous separation of mineral values from said slurry by treatment including the step of froth flotation, the improvement comprising measuring the range of oxidation-reduction potentials of the said chemically treated slurry developed in efficient operation of said system as it is varied with variations of said ore body to define a preselected range of optimum potentials, and supplying said chemical substance to the slurry in quantity controlled to maintain the oxidation-reduction potential of said slurry in said preselected range during the flotation step of said treatment.

3,883,422

SILVERWARE FEEDER CONSTRUCTION

Ralph Ettlinger, Jr., Highland Park; Robert B. Dietsche, Deerfield, and John W. MacAllister, Prospect Heights, all of Ill., assignors to Avant Industries, Inc., Wheeling, Ill.

Filed June 20, 1973, Ser. No. 371,703
Int. Cl. B07c *1/10*
U.S. Cl. 209—75 13 Claims



1. In a construction for sorting spoons wherein the bowls of the spoons are of different sizes, the improvement comprising a sorter bed, said sorter bed defining a plurality of spaced parallel grooves, loading means for depositing spoons on said bed, means associated with the bed for moving spoons along the bed and including at least one opening defined at the bottom of one of said grooves whereby said spoons can pass

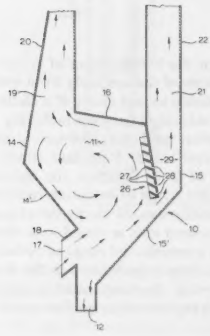
through said sorter bed, said opening being dimensioned so that the handles of the spoons will pass through the sorter bed with the spoon bowls suspending the spoons on the bed, a first portion of said opening dimensioned to permit the passage of smaller bowl spoons through the opening, and including a second portion of said opening, said second portion defining wing sections adapted to receive bowl edges of larger bowl spoons whereby the larger bowl spoons drop through said sorter bed at said second portion.

3,883,423

VERTICAL CLASSIFIER

Robert R. Turner, Oakville, Ontario, and Ralph H. Hart, Mississauga, Ontario, both of Canada, assignors to Aerofall Mills Limited, Mississauga, Ontario, Canada

Filed Aug. 1, 1973, Ser. No. 384,456
Int. Cl. B07b 7/04
U.S. Cl. 209—143 6 Claims



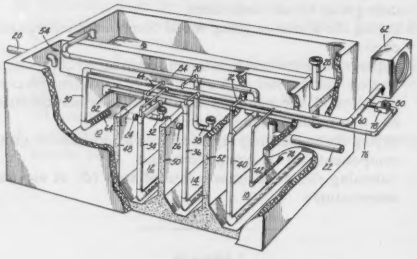
1. A vertical classifier for particulate solid material entrained in a fluid carrier, comprising a vessel defining a horizontally oriented separating chamber having a bottom discharge opening for the discharge of separated solid material, said vessel having a pair of side walls, a front wall providing an inlet opening communicating with a lower portion of the chamber, a rear wall, and a top wall providing an outlet opening communicating with an upper portion of the chamber and positioned adjacent to the front wall, inlet passage means communicating with said inlet opening, outlet passage means communicating with said outlet opening, said inlet passage means providing an upwardly inclined duct for directing inflowing fluid in an upwardly inclined direction towards the rear wall, and said rear wall having a rearwardly inclined portion extending from the discharge opening approximately in said upwardly inclined direction, said inlet and outlet passage means defining an upwardly curved flow path for effecting centrigual separation of solid material from the fluid stream within the chamber, baffle means located in the chamber at a position to intercept the flow of inflowing fluid and deflect a portion of the entrained material inwardly of said curved flow path, and means defining a deflector surface ppsitioned to induce a downward flow of a portion of said fluid stream thereby to create a horizontal vortex within the chamber, said means defining a deflector surface being constituted by a downwardly and rearwardly inclined portion of said front wall terminating adjacent to said inlet opening.

3,883,424

METHOD AND APPARATUS FOR TREATMENT OF DOMESTIC WASTE WATER

Raymond P. Stamblesky, Mentor, and William R. Jones, Eastlake, both of Ohio, assignors to John Kruger, Willoughby; Lee Friedabaugh, Concord Township and William N. Hogg, Gates Mills, all of Ohio, part interest to each

Filed June 6, 1973, Ser. No. 367,647
Int. Cl. C02c 1/08
U.S. Cl. 210—5 10 Claims



1. A device for treating residential waste water comprising, tank means having a plurality of separate tank sections including an influent receiving section, an effluent discharge section, and at least one intermediate section,

means to deliver influent to said influent receiving section, means to provide air agitation to the waste water in said influent receiving section, means to discharge water above a given level responsive and proportional to water received in said discharge section from said effluent discharge section,

means interconnecting said influent receiving section each of said intermediate sections and said discharge section to provide fluid flow from said influent receiving section to said intermediate sections and to said effluent discharge section, return means to at least periodically return a portion of the waste water in at least one intermediate section to the influent receiving section, further characterized by the means interconnecting two successive sections including air lift means to positively deliver waste water above a given level from one section and responsive and proportional to water delivered to the unit to the next succeeding section as the only interconnection therebetween and operative by the means to provide air agitation whereby flow through and out of the unit is porportional to the intake, but flow through is halted when the means to provide air ceases to function.

3,883,425

DETOXIFICATION OF SAPONINS

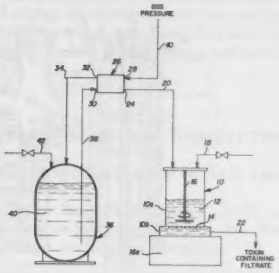
Gordon L. Dorn, Dallas, Tex., assignor to J. K. & Susie L. Wadley Research Institute and Blood Bank, Dallas, Tex.

Filed Dec. 10, 1973, Ser. No. 423,447
Int. Cl. B01d 13/00
U.S. Cl. 210—23 14 Claims

1. In a method of obtaining purified saponin from a plant source wherein a component rich in saponin and which will hemolyze red blood cells is extracted from said plant source,

the improvement comprising:

removing antimicrobial toxic constituents from said saponin



extract which when in aqueous solution have an apparent molecular weight of less than about 600.

3,883,426

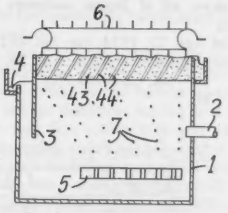
PROCESS FOR TREATING WASTE WATER

Sylvette Odette Rosalie Laurent Lewandowski, and Raymond Lewandowski, both of Rennes, France, assignors to Etudes et Procedes d'Assainissement Purator, France

Filed July 16, 1973, Ser. No. 379,907

Int. Cl. B03d *1/00;* **C02b** *1/20*

U.S. Cl. 201—44 **7 Claims**



1. A process for treating waste water to remove impurities therefrom, which comprises contacting in a flotation zone said waste water and aluminum having on at least one surface an amalgam of aluminum and mercury, allowing said waste water to react with said amalgam to form hydrogen gas and alumina in situ, removing from said zone impurities that have been carried to the surface of the waste water by the evolved hydrogen gas and alumina, and recovering purified waste water.

3,883,427

FLOATING SOLIDS RETURN DEVICE

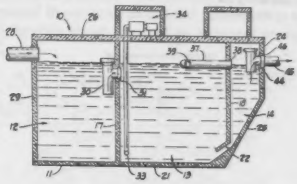
Robert R. Oldham, and John H. Wooddell, both of Sidney, Ohio, assignors to Robert R. Oldham, Inc., Sidney, Ohio

Continuation-in-part of Ser. No. 351,274, April 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 239,887, March 31, 1972, Pat. No. 3,805,957. This application Mar. 28, 1974, Ser. No. 455,642

Int. Cl. C02c *1/12*

U.S. Cl. 210—73 **1 Claim**

1. A process for returning floating solids from a first portion of a tank, having fluid therein and divided into two portions by partition means, to the second portion wherein a current, the major portion of which is in a determinable direction, is induced, said process comprising the steps of providing conduit means at the surface of the fluid, said conduit means being substantially "J-shaped" with a longitudinal axis and having a first opening at one end extending transversely of said axis and communicating with the surface of said fluid in said first portion of said tank, a curved or reentrant portion, and a second opening extending transversely of said axis, nearer said curved or reentrant portion than said first opening, and opening into said second portion of said tank and being in communication with the surface of the fluid therein, determining the direction of flow of the major portion of the current in



said second portion of said tank at the surface of fluid therein adjacent said second opening, and cutting or severing said conduit means transversely of said axis along said curved or reentrant portion thereof to face said opening in the direction in which said major portion of said current is determined to be flowing.

3,883,428

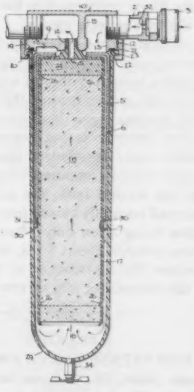
FILTER

Robert W. Waring, 197 Old Post Rd., Fairfield, Conn. 06430

Filed Sept. 14, 1973, Ser. No. 397,388

Int. Cl. B01d *27/00*

U.S. Cl. 210—94 **7 Claims**

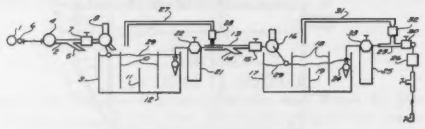


1. A liquid filter comprising the combination of an elongated hollow casing having a liquid inlet and a liquid outlet at one end thereof, an elongated inner chemical filter element comprising an imperforate sheath with its opposite ends open and filled with chemical filter material, said inner filter element being positioned within said casing with one open end of the sheath adjacent to said inlet and outlet and communicating only with the filter outlet and having the sheath's opposite open end in communication with the interior of the hollow casing, a space between the inner filter sheath and the inner surface of the casing in communication with said filter inlet, a second filter element comprising an elongated fibrous boot positioned in said space engaging the inner surface of the casing and the sheath of said inner filter and fixed at said one open end of said sheath whereby the liquid flows from said filter inlet through the boot in said space and thereafter through the said opposite open end of said inner filter element sheath and through said chemical filter material to said outlet.

3,883,429
PORTABLE WATER SUPPLY SYSTEM

William E. Hanford, North Tarrytown, N.Y., assignor to World Water Resources, Inc., New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,174
Int. Cl. B01d 21/24, 29/36
U.S. Cl. 210—104 15 Claims



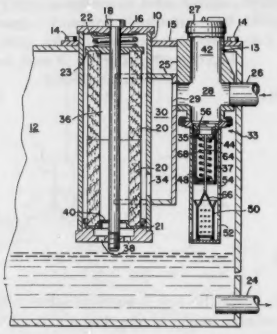
1. An apparatus for rendering contaminated water potable which comprises
- a water source;
- a first purification tank communicating with the water source by way of a first conduit provided with at least one flexible baffle;
- a second purification tank communicating with the first tank by way of a second conduit the second tank being provided with at least one flexible baffle;
- a prefiltering means for removing particulate matter from water flowing through the first conduit;
- a first recycle means communicating between the second conduit and the first tank the first recycle means having a first normally closed, pressure-relief valve, the valve being open only when a pressure greater than about 8 psi exists in the second conduit;
- a first pressure filter, positioned in the second conduit upstream of the first recycle means;
- a chemical addition means being positioned in the second conduit between the first recycle means and the second tank, the means being capable of terminating the flow of water into the second tank when the level of water in the second tank reaches a pre-determined height;
- an outlet means communicating between the second tank and a purified water distribution means;
- a second recycle means communicating between the outlet means and the second tank, the second recycle means having a second normally closed pressure relief valve, the second valve being open only when the pressure in the outlet means exceeds about 8 psi; and
- a second pressure filter positioned in the outlet means upstream of the second recycle means.

3,883,430
FILTER AND BYPASS VALVE ARRANGEMENT

Edward A. Codo, Joliet, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Feb. 20, 1973, Ser. No. 334,090
Int. Cl. B01d 27/10
U.S. Cl. 210—132 9 Claims

1. In a fluid supply system having fluid reservoir means for containing fluid utilized in said supply system, a combined filter and by-pass apparatus comprising; filling spout means for supplying fluid to said reservoir means, said spout means having inlet and outlet means, first chamber means in communication with said spout means outlet means, normally closed valve means having inlet means in communication with said first chamber means and outlet means in communication with said reservoir means, said valve means including housing means removably secured to said spout means, primary fluid filtering means having inlet means in communication with said first chamber means and having outlet means in communication with said reservoir means, said combined filter and by-pass apparatus being disposed at least partially within said reservoir means and positioned such that all fluid entering said supply system must pass through said first chamber means before entering said reservoir means, said normally closed valve means including a valve member secured within said valve housing means by retainer means, said valve member

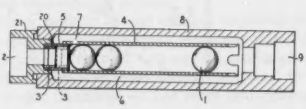


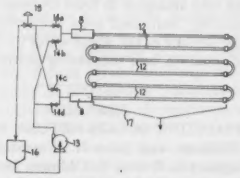
being manually removable from said valve housing means through said spout inlet means, said retainer means including bail means for coacting with lug means and recess means to retain said valve member within said housing means.

3,883,431
CLEANING APPARATUS

Kiyoshi Ishii; Shobu Konomi, both of Ohimachi, and Yoshio Ishiguro, Tokyo, all of Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Apr. 22, 1974, Ser. No. 462,629
Claims priority, application Japan, Apr. 25, 1973, 48-49389
Int. Cl. B08b 9/04
U.S. Cl. 210—134 7 Claims





1. In a fluid-flow system comprising a tubular piping arrangement having reversing valve means for reversing the direction of flow of fluid through the piping arrangement, one or more resiliently compressible objects movable back and forth through said piping arrangement to clean same, and retaining means adapted to retain said object or objects at the ends of the travel thereof through said piping arrangement, the improvement in which said retaining means comprises a container which is open at one end for receiving said objects from or directing said objects into said tubular piping arrangement and which is blocked at its opposite end by a porous barrier; by-pass conduit means connected in parallel with said container for by-passing liquid around said container; and check valve means coupled to the blocked end of the container and which is responsive to the direction of flow of liquid

through said piping arrangement for movement between positions in which (1) the liquid entering said tubular piping arrangement flows substantially entirely through said porous barrier and said container to force said object or objects through said piping arrangement, and (2) the liquid leaving said tubular piping arrangement flows into said container and then through said by-pass conduit means and said check valve means.

3,883,432

SYSTEM FOR PURIFYING AND DISINFECTING WASTE WATER

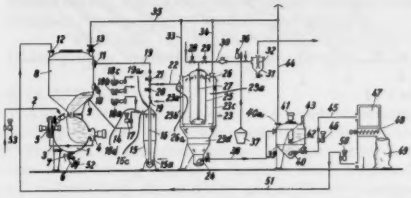
Karl-Heinz Hildebrand, Fachbachtal 40, 5421 Fachbach Bad-Ems, Germany

Continuation of Ser. No. 172,351, Aug. 12, 1971, abandoned. This application Sept. 13, 1973, Ser. No. 396,741

Claims priority, application Germany, Aug. 12, 1970, 2040061

Int. Cl. B01d *21/16*

U.S. Cl. 210—152 **8 Claims**



1. A system for the continuous purification and disinfection of sewage comprising:

a first mixing tank for homogenizing the sewage, said first mixing tank having a sewage inlet, a drain for solid substances which collect on the bottom of said first mixing tank and a sewage discharge leading to a feed back line returning to said first mixing tank and wherein a pump and a disintegrating means are arranged in said line, said first mixing tank including a reservoir positioned thereabove and wherein a sewage outlet is located;

a second mixing tank arranged downstream from said reservoir having a sewage inlet connected with the sewage outlet of said reservoir, a sewage outlet and at least one inlet for chemicals;

a closed vessel having an upper tangential inlet which is connected with the sewage outlet of said second mixing tank and which opens into an outer annular chamber, said outer chamber being open at the bottom and in communication with an inner annular chamber which is in communication with an outlet of said closed vessel, each of said outer and inner annular chambers being in communication with a third chamber positioned below said first and second annular chambers and provided with a sludge drain;

a filter associated with said closed vessel and arranged downstream from said upper tangential inlet of said closed vessel; and

a disinfecting means positioned downstream from said filter.

3,883,433

COLLECTION AND RECOVERY SYSTEM FOR OIL SPILLS

Frank Adams March, and Louis Stanislaus Brown, both of Reston, Va., assignors to Ocean Systems, Inc., Reston, Va.

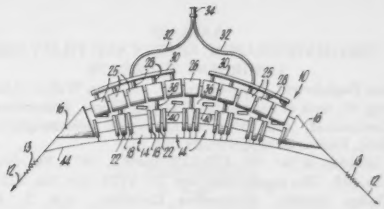
Continuation-in-part of Ser. No. 269,725, July 7, 1972, abandoned. This application Sept. 20, 1973, Ser. No. 399,339

Claims priority, application Netherlands, July 4, 1973, 7309366

Int. Cl. E02b *15/04*

U.S. Cl. 210—242 **11 Claims**

10. Apparatus for collecting an immiscible liquid, such as oil, spread on a body of water, including a basin with a flexible sheet bottom said basin being supported by floatation to maintain its rearward edge above the water line, a primary weir attached to the forward edge of said basin and supported by floatation, and oil withdrawal means for drawing oil from said basin, said primary weir having weir openings therein for passage of liquid from the upper layer of said body of water into said basin, said primary weir having a plurality of rigid modules disposed therealong in spaced relationship with one another, said flexible sheet connecting adjacent modules and



providing a barrier to flow between modules, each module comprising two spaced, weir floats elongated in the fore-aft direction with a weir plate affixed therebetween with the weir lip extending generally across the space between the weir floats, and with the plane of the weir plate at an acute angle to the long dimension of the weir floats, the module floating stably with the weir plate inclined into the water, its lip being forward and higher, thereby causing as the apparatus moves over the body of water a thickening of the oil ahead of the weir plate and a reduced pressure beneath said basin.

3,883,434

REVERSE OSMOSIS APPARATUS

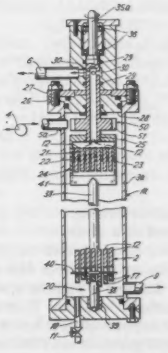
Ronald Gayler, Wantage, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 5, 1973, Ser. No. 403,835

Claims priority, application United Kingdom, Oct. 25, 1972, 49220/72; May 4, 1973, 21409/73

Int. Cl. B01d *31/00*

U.S. Cl. 210—330 **7 Claims**



1. Reverse osmosis apparatus comprising a stationary pressure shell, at least one bundle of rods disposed lengthwise within the shell so as to be rotatable within the shell about an axis, each rod having at least one longitudinally extending groove therein, a permeable substrate in the form of a sleeve covering the rod and a reverse osmosis membrane deposited on the substrate, manifold means mounted on one common end of a plurality of said rods, a hollow shaft attached to the

manifold means, and extending along said axis, turbine means arranged to be energised by the pressure head of the feed solution for rotating the shaft and hence the bundle of rods within the said shell, means comprising a conduit for supplying a feed solution to the pressure shell so as to obtain a product liquid within said groove and said manifold by reverse osmosis, and means for collecting said product liquid by way of said shaft.

3,883,435

CHROMATOGRAPHIC SHEETS AND FILMS AND ADSORBENT THEREFOR

Bruno Englebrecht, Langemarckstr. 31; Hans Walker, Lindenweg 10, both of Eschwege; Johannes Blome, Rohgraben 11, Grebendorf, and Friedemann Jordan, Johannuplatz 4a, Buhl, Baden, all of Germany

Division of Ser. No. 130,822, April 2, 1971, Pat. No. 3,726,405. This application Jan. 23, 1973, Ser. No. 326,127

Claims priority, application Germany, Apr. 2, 1970, 2015672

Int. Cl. B01d *15/08*

U.S. Cl. 210—502 **3 Claims**

1. An adsorbent for a chromatographic sheet or film, said adsorbent comprising a mixture of adsorption active silica gel powder and from 1 to 50 percent by weight of silicic acid in the form of a silica sol having a content of from 1 to 15 percent of colloidal silicic acid, based on the weight of said adsorption active powder.

3,883,436

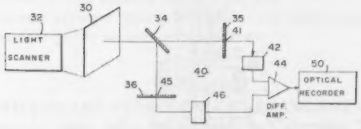
PHYSICAL CORRECTION FILTER FOR IMPROVING THE OPTICAL QUALITY OF AN IMAGE

James C. Fletcher, Administrator of the National Aeronautics and Space Adminstration with respect to an Invention of Shui Yee Lee, Washington, D.C.

Filed July 16, 1971, Ser. No. 163,151

Int. Cl. G01n *21/30*

U.S. Cl. 250—566 **8 Claims**



1. An optical system comprising:

a photographic record of a scene;

light source means for scanning said record:

filter means for receiving light from said scanned record, said filter means defining a pinhole aperture characterized by a substantially constant Fourier transform in response to a unit impulse of light and at least one other aperture whose configuration is a function of the characteristics of said scene record with light from said scanned record passing through said pinhole aperture and said other aperture; and

means for providing an output which is a function of the difference of the light passing through said pinhole aperture and said other aperture, said record being of low resolution due to scene double exposure and said at least one other aperture comprising a pair of pinholes spaced a distance related to said double exposure.

3,883,437

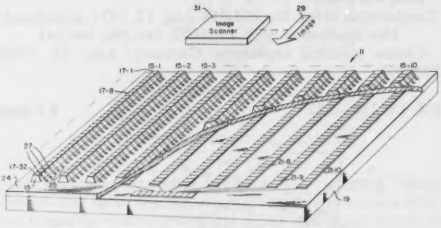
MONOLITHIC IR DETECTOR ARRAYS WITH DIRECT INJECTION CHARGE COUPLED DEVICE READOUT

Kjell Nummedal, Los Angeles; Donald J. Holscher, Playa del Rey; John M. Hartman, Costa Mesa, and Darrell M. Erb, Newport Beach, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 25, 1974, Ser. No. 436,586

Int. Cl. G01t *1/24*

U.S. Cl. 250—332 **9 Claims**



1. In an imager the combination comprising:

A. An array of infrared detectors, each operable to generate an electrical signal in response to infrared radiation; and

B. means for processing said signals, said means including:

1. A charge-coupled signal collecting device comprised of:

a. a storage medium,

b. a dielectric layer disposed over a major surface of said medium,

c. a plurality of electrodes disposed over said dielectric layer for creating in response to voltages applied thereto a succession of potential wells in said storage medium and for passing an electric charge from given ones of said wells to succeeding ones of them,

d. means d.c. coupled to said detectors for injecting directly into said storage medium next to successive ones of said potential wells, a charge in response to the output of respective ones of said detectors,

2. means for applying voltages to said electrodes so as to step said injected charges through the potential wells of said charge-coupled device, and

3. means coupled to said signal collecting device for reading out said stepped charges.

3,883,438

ABSORBENT COMPOSITION

Robert K. Remer, Evanston, Ill., assignor to Hull-Smith Chemicals, Inc., Des Plaines, Ill.

Continuation of Ser. No. 129,602, March 30, 1971, abandoned. This application June 29, 1973, Ser. No. 374,929

Int. Cl. C09k *3/00*

U.S. Cl. 252—1 **12 Claims**

1. An absorbent composition comprisng an effective amount of the reaction product formed in an alkaline aqueous medium of polyvalent metal ions, amine or amide compound, carbon disulfide, and a major amount of water-dispersible or ammoniacal-dispersible reactive high molecular weight compound or polymer material, wherein the amount of carbon disulfide is sufficient to react with substantially all of the amine or amide.

3,883,439

GREASE COMPOSITION

Josef F. Bergeron, Los Angeles, Calif., assignor to Jet Lube, Inc., Glendale, Calif.

Filed Apr. 17, 1974, Ser. No. 461,658
Int. Cl. C10m *5/22, 5/14, 7/36*
U.S. Cl. 252—37.2 26 Claims

1. A thixotropic lubricating compound having a reversible gel structure comprising the reaction product of significant amounts of a crude fish oil, a sulfurmodified sperm oil, a microcrystalline wax and an oxide of lead.

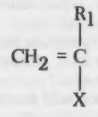
3,883,440

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPH

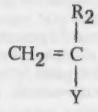
Yasuo Tamai, Odawara; Sadao Osawa, Asaka; Satoru Honjo, Asaka; Akira Umehara, Asaka; Masaya Yamamoto, Tokyo; Nobuo Tsuji, Ashigara; Naomitsu Takashina, Fujisawa, and Wakio Nagashima, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara and Mitsubishi Gas Chemical Company, Incorporated, Tokyo, both of, Japan

Filed June 15, 1973, Ser. No. 370,212
Claims priority, application Japan, June 16, 1972, 47-60110
Int. Cl. G03g *9/04*
U.S. Cl. 252—62.1 11 Claims

1. A liquid developer for electrophotography comprising a carrier liquid having an electric resistance higher than about 10^{10} Ω.cm. and a dielectric constant less than about 3, said carrier liquid having dispersed therein a toner prepared by graft polymerizing the addition polymerizable compound represented by formula (I) and the addition polymerizable compound represented by formula (II) onto pigment particles;

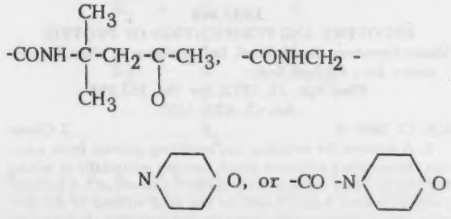


(I)



(II)

wherein R_1 represents —H or $—CH_3$, X represents $—COOC_nH_{2n+1}$ ($6 \leq n \leq 20$), R_2 represents —H, and Y represents —$CONHCH_2OH$, —$CONHCH_2OCH_3$, —$CONHCH_2OC_2H_5$, —$CONHCH_2OC_3H_7$, —$CONHCH_2OC_4H_9$,



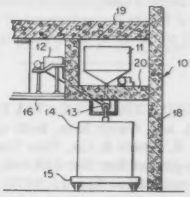
the ratio of the addition polymerizable compound of formula (I) to the addition polymerizable compound of formula (II) being 5 – 45 parts by weight to 1 part by weight of the compound of the formula (II); the size of the pigment particles being less than about 1 micron; and from about 0.1 to about 20 parts by weight of the toner being present per 1000 parts by weight of the carrier liquid.

3,883,441

APPARATUS FOR FIXING RADIOACTIVE WASTE

John D. Murphy, Bedford Hills; John Pirro, Jr., Rutland; Monsey Lawrence, and Stanley F. Wisla, both of Yorktown Heights, all of N.Y., assignors to Atcor Inc., Park Mall, Peekskill, N.Y.

Filed July 20, 1970, Ser. No. 56,625
Int. Cl. C09k *3/00*
U.S. Cl. 252—301.1 W 3 Claims



1. A waste processing facility for preparing radioactive wastes for disposal which includes means defining a shielded enclosure, a metering tank positioned in said enclosure, said metering tank including metering means for removing liquid contents therefrom at a metered rate and measuring means for measuring the radioactivity of liquid contents thereof, mixing means for continuously receiving, mixing and discharging fixing materials and liquids said mixing means being connected to said metering means to receive the contents of said tank through said metering means, fixing materials feed means connected to said mixing means to deliver fixing materials thereto at a regulated rate, means defining a space in which to position a container relative to said mixing means to receive the discharged contents therefrom.

3,883,442

NON-SHRINKING ALUMINA-BASED CATALYST COMPOSITIONS

Dennis P. McArthur, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 255,180, May 19, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,139
Int. Cl. B01j *11/82*
U.S. Cl. 252—432 11 Claims

1. A method for the manufacture of a supported active metal catalyst which resists shrinkage at high temperatures, which comprises:

1. impregnating preformed, cohesive aggregates of an alumina hydrate or transition alumina support with a solution of a B_2O_3 precursor to incorporate therein between about 0.2 and 25 weight-percent of B_2O_3 equivalent;
2. calcining the impregnated support at a temperature between about 675° and 1500°C. for a time sufficient to decompose said B_2O_3 precursor and to substantially reduce thermal shrinkage of said support, but insufficient to reduce the surface area thereof to below about 5 m^2/g, said calcination being carried out prior to the addition of any catalytic metal component capable of combining with B_2O_3 at said calcination temperature;
3. impregnating the calcined support with a solution of a salt of at least one catalytic metal selected from Groups IB, IIB, VB, VIB, VIIB and VIII of the Periodic Table; and
4. calcining the salt-impregnated support to convert the impregnated salt or salts to an active catalytic form.

3,883,443

CATALYST ASSEMBLY FOR REMOVING NOXIOUS GASES FROM AUTOMOBILE EXHAUST

Teruyuki Nakamoto; Yoshioki Shingo, both of Tokyo; Tetsuo Yamaguchi, Yokohama, and Yukio Endo, Tokyo, all of Japan, assignors to Fujikura Densen Kabushiki Kaisha, Japan

Filed Apr. 16, 1973, Ser. No. 351,761
Claims priority, application Japan, Apr. 21, 1972, 47-40176
Int. Cl. B01j *11/22*
U.S. Cl. 252—447 **12 Claims**

1. A catalyst assembly for removing noxious gases from the automobile exhaust comprising a plurality of highly gas permeable catalyst layers each thereof composed of a copper-nickel catalyst, and a plurality of highly gas permeable separating layers each thereof composed of a ferrous material, said plurality of catalyst layers being supported and isolated from each other by said plurality of separating layers.

3,883,444

AUTO EXHAUST CATALYST

James M. Maselli, and Gwan Kim, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 164,466, July 20, 1971, abandoned. This application Apr. 11, 1973, Ser. No. 350,212
Claims priority, application United Kingdom, June 20, 1972, 28868/72
Int. Cl. B01j *11/08*
U.S. Cl. 252—455 R **7 Claims**

1. A composition useful as an internal combustion engine exhaust catalyst which comprises 4–20 weight percent cobalt oxide, 0.1–15 weight percent nickel oxide, 0.005–0.1 weight percent palladium and the remainder being support material such that the total weight percent equal 100.

3,883,445

SHRINKAGE RESISTANT AUTO EXHAUST CATALYSTS

James F. Roth, St. Louis; James W. Gambell, Creve Coeur, and Charles R. Penquite, Ballwin, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 160,549, July 7, 1971, Pat. No. 3,781,406. This application Aug. 23, 1973, Ser. No. 391,167
Int. Cl. B01j *11/06, 11/32*
U.S. Cl. 252—462 **22 Claims**

1. A catalytic oxidation composite effective at elevated temperature and particularly resistant to volume shrinkage and other thermal degradation consisting essentially of an alumina which is a transition alumina and other than alpha alumina and having dispersed therein loadings of copper, chromium and rare earth components, with the loadings of the said components being intermixed and well dispersed throughout the alumina rather than limited to separate regions of the alumina, and with the loadings being present, on a metal basis per 100 parts Al_2O_3 basis, in amounts of 2 to 15 weight parts copper, 0.1 to 10 wt. parts chromium, and 1 to 15 weight parts total rare earths, with at least 1 weight part of the rare earth being selected from the group consisting of lanthanum, neodymium, praseodymium, and mixtures thereof, and with the copper being predominantly well dispersed copper aluminate as determined by ESCA and with the alumina used to prepare the composite having surface area of at least 50 m^2/gram so as to provide sufficient surface for the copper to be well dispersed.

3,883,446

PHOSPHORUS-FREE DETERGENT FORMULATION

Stephen E. McGuire, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 9, 1973, Ser. No. 330,932
Int. Cl. C11d *1/02, 3/34*
U.S. Cl. 252—545 **4 Claims**

1. A nonphosphorus-containing detergent formulation consisting essentially of a surfactant and an alkali metal, ammonium, or alkylolammonium salt of a water-soluble terpolymer of about 10 to 40 percent by weight allyl alcohol, about 1 to 43 percent by weight sulfur dioxide and about 20 to 83 percent by weight acrylic or methacrylic acid, provided that the particular proportions fall within the shaded area of the diagram on the annexed drawing; said surfactant being

a. an alkali metal, ammonium, or alkylolammonium alkylbenzene sulfonate;
b. an alkali metal, ammonium, or alkylolammonium olefin sulfonate;
c. an alkali metal, ammonium, or alkylolammonium alkylsulfonate;
d. an alkali metal, ammonium, or alkylolammonium alkanol sulfate;
e. an alkali metal, ammonium, or alkylolammonium alkoxylated alkanol sulfate;
f. alkoxylated alcohols;
g. or mixtures thereof;

said terpolymer salt being present in amounts ranging from about 0.1 to about 25 parts by weight per part by weight of the surfactant.

3,883,447

TRANSPARENT LIQUID DETERGENT COMPOSITION

Fumikatsu Tokiwa, Wakayama; Kyozaburo Tachibana, Sakura; Yutaka Minegishi, Funabashi, and Tetsuya Imamura, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1972, Ser. No. 316,828
Claims priority, application Japan, Dec. 29, 1971, 46-2977
Int. Cl. C11d *1/18*
U.S. Cl. 252—546 **6 Claims**

1. A transparent, stable, liquid detergent composition comprising an aqueous solution of

A. as essentially the only organic surfactant components in the detergent composition, a three component surfactant consisting essentially of
   1. from about 30 to about 55 percent by weight of straight chain alkylbenzene sulfonate
   2. from about 30 to about 60 percent by weight of α-olefin sulfonate, and
   3. from about 5 to about 20 percent by weight of polyoxyethylene alkyl- or alkylphenyl ether;
B. from about 0.1 to 3.0 parts by weight, per one part of constituent A, or water-soluble salt of nitrilotri-acetic acid;

the composition containing at least 25 percent by weight of the sum of constituents A and B.

3,883,448

RECOVERY AND PURIFICATION OF PROTEIN

Moshe Sternberg, South Bend, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 23, 1973, Ser. No. 353,895
Int. Cl. A23j *1/20*
U.S. Cl. 260—8 **2 Claims**

1. A process for isolating and purifying protein from aqueous cheese whey solutions which consists essentially of mixing the cheese whey solution with about 0.1 to about 1.0 percent, (weight/volume basis) based on the total volume of the mixture, of a polycarboxylic acid selected from the class consisting of polyacrylic acid, hydrolyzed ethylene-maleic anhydride copolymers and hydrolyzed methyl vinyl ether-maleic anhydride copolymers at a pH from about 3 to about 4.5 and at a temperature below about 30° C. and for a time from about 30 minutes to about 90 minutes to form a precipitate between the protein in the cheese whey solution and the polycarboxylic acid, and then separating the resulting precipitate from the remaining cheese whey solution.

3,883,449

POLYMERIZATION OF 1,4-HALOSUBSTITUTED-2,3-EPOXYBUTANES

Edwin James Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 322,585, Jan. 10, 1973. This application Apr. 30, 1973, Ser. No. 355,395The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl. C08g *23/14*

U.S. Cl. 260—2 A **10 Claims**

1. A process for producing polymers of 1,4-halosubstituted-2,3-epoxybutanes comprising contacting at least one 1,4-halosubstituted-2,3-epoxybutane under polymerization conditions at a temperature below 0°C. with at least a catalytic amount of a catalyst combination consisting essentially of

a. an aluminum trialkyl or an aluminum trialkyl which has been reacted with up to about 1.5 mole of water per mole of aluminum, and

b. boron trifluoride, phosphorus pentafluoride, phosphorus oxyfluoride or antimony pentafluoride, components (a) and (b) being present in said combination in a molar ratio of from about 0.02:1 to about 5:1.

3,883,450

PROCESS FOR PRODUCING HOMO- AND COPOLYMERS OF CYCLIC ACETALS

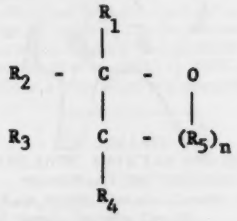
Karlheinz Burg, Langenhain/Taunus, and Helmut Schlaf, Kelkheim/Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 281,559, Aug. 17, 1972, Pat. No. 3,848,020. This application May 9, 1974, Ser. No. 468,563 Claims priority, application Germany, Aug. 19, 1971, 2141600

Int. Cl. C08g *11/00*

U.S. Cl. 260—2 R **3 Claims**

1. In a process for producing a moldable homopolymer of a cyclic acetal of the formula



wherein R_1, R_2, R_3 and R_4 may be the same or different and represent hydrogen or an alkyl group which can be halogen-substituted, R_5 represents an oxymethylene radical which can be substituted by an alkyl or halogen-substituted alkyl group, and n is 1 to 3, or when n is 1, R_5 can be the radical $-(O-CH_2CH_2)_m-OCH_2-$ wherein m is 1 to 3, at a temperature between the melting point and boiling point of the monomer or monomer mixture in the presence of a protonic acid, the improvement which consists in using an anhydrous perfluoroalkyl sulfonic acid with one to 18 carbon atoms as the protonic acid.

3,883,451

FLAME-RETARDANT POLY (ARYLOXYPHOSPHAZENE) COPOLYMERS

Kennard A. Reynard, Mentor, and Selwyn H. Rose, Beachwood, both of Ohio, assignors to Horizons Incorporated, Cleveland, Ohio

Filed June 11, 1973, Ser. No. 368,848

Int. Cl. C08g *33/16, 33/02*

U.S. Cl. 260—2 P **10 Claims**

1. Poly(aryloxyphosphazene) copolymers consisting of 20 to 50,000 randomly repeating units represented by the following general formulas:

wherein R_1 and R_2 are different monovalent aryl radicals, and R_1 is an aryl radical selected from the group consisting of phenyl, 3-substituted phenyl, 4-substituted phenyl, 3,4-disubstituted phenyl, 3,5-disubstituted phenyl and 3,4,5-trisubstituted phenyl, wherein the substituents are selected from the group consisting of lower alkyl, lower alkoxy, and halogen, but not more than one substituent may be halogen, and R_2 is XC_6H_4-, $X_2C_6H_3-$, 2,4,5—$Cl_3C_6H_2-$, 2,4,6—$Cl_3C_6H_2-$, 2,3,4,6—Cl_4C_6H-, and C_6Cl_5- where X is Cl or Br, but Br can only occupy the 3,4 or 5 position; wherein the ratio of R_1/R_2 groups for 3- or 4- monosubstituted phenyl can vary from 95/5 to 5/95, and the R_2 group will decrease approximately 15 mole percent for each additional halogen in R_2 plus an additional an additional 15 mole percent for each ortho position that is occupied by halogen.

3,883,452

COMPOSITION OF POLYIMIDE POWDER AND POLYFORMALDEHYDE

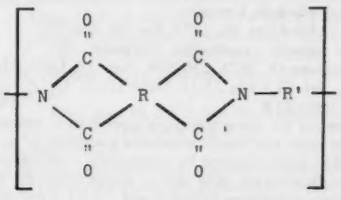
Edwin Louis Scheuerlein, and Frank Clyde Starr, Jr., both of Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 15, 1973, Ser. No. 360,582

Int. Cl. C08g *53/08;* **C08j** *1/14*

U.S. Cl. 260—2.5 M **15 Claims**

1. A composition comprising a coalescible polyimide powder and 5 to 50% by weight, based upon the total weight of said composition, of a solid, particulate homopolymer of formaldehyde, wherein said polyimide is characterized by the following recurring structural unit:



wherein R is a tetravalent radical containing at least one six-carbon atom ring characterized by benzenoid unsaturation and wherein the four carbonyl groups of said recurring structural unit are attached to separate carbon atoms in pairs with the carbonyl groups of each pair being attached to adjacent carbon atoms in said R radical; and wherein R' is a divalent aromatic radical.

3,883,453

COATING COMPOSITIONS CONTAINING ACRYLIC POLYMERS POLYMERIZED IN THE PRESENCE OF CELLULOSE ACETATE BUTYRATE

Masao Takahashi; Tadanori Fukuda, and Tosirou Kataoka, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 10, 1973, Ser. No. 358,855
Int. Cl. C08b 21/08
U.S. Cl. 260—15 6 Claims

1. A coating composition comprising an intimate mixture of the following components A and B:

A. about 60 – 90% by weight of a dispersion of copolymer obtained by copolymerizing a mixture of acrylic monomers which consist of

a. about 30–96% by weight of at least one monomer selected from the group consisting of alkyl acrylate monomers and alkyl methacrylate monomers, wherein the alkyl groups have 1 – 20 carbon atoms, and

b. about 70–4% by weight of at least one monomer selected from the group consisting of hydroxyalkyl acrylate monomers and hydroxyalkyl methacrylate monomers wherein the alkyl groups have 2–20 carbon atoms, an α,β-ethylenically unsaturated carboxylic acid, acrylamide, methacrylamide, methylol acrylamide, methylol methacrylamide, butoxymethyl acrylamide, butoxymethyl methacrylamide, butoxymethyl acrylamide, and butoxyethyl methacrylamide in the presence of a solution of cellulose acetate butyrate with a peroxide catalyst, the proportion of component (a) to cellulose acetate butyrate being between about 50 and 2, and

B. about 10 – 40% by weight of amino resin, wherein the cellulose acetate butyrate has about 53–37% by weight of butyryl content, about 2–14% by weight of acetyl content and about 0.5–3% by weight of hydroxyl content, and in which the content of cellulose acetate butyrate in the cellulose acetate butyrate solution is about 2–30% by weight.

3,883,454

BINDERS FOR ENVIRONMENTALLY HARMLESS LAQUER SYSTEMS

Rolf Dhein; Bernd-Ulrich Kaiser, both of Krefeld; Hans Rudolph, Krefeld-Bockum; Rolf Küchenmeister, and Clemens Niehaus, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Oct. 29, 1973, Ser. No. 410,771
Claims priority, application Germany, Oct. 31, 1972, 2253325; June 19, 1973, 2304550; Aug. 31, 1973, 2343976
Int. Cl. C08g 37/34; C09d 11/10, 11/12
U.S. Cl. 260—22 R 8 Claims

1. A binder for a low solvent lacquer system containing a melamine resin, said binder consisting essentially of an oligomeric alkyd resin obtained by condensing a polyalcohol, an aromatic dicarboxylic acid and a monocarboxylic acid in molar ratios of between 1:0.5:0.5 and 1:0.8:1.5 and by additionally partially condensing 0.05 to 0.65 equivalents of aromatic dicarboxylic acid as a semiester with each 1,000 parts by weight of alkyd resin, said monocarboxylic acid being selected from the group consisting of unsaturated natural fatty acids, benzoic acid, hexahydrobenzoic acid, butyl benzoic acid, tolyl acid, α-ethylhexanoic acid, saturated, branched and linear fatty acids having eight to 18 carbon atoms per molecule and mixtures thereof.

3,883,455

NON-BLEEDING VINYLIDENE CHLORIDE COPOLYMER COATINGS

Charles E. Peos, East Orange, N.J., assignor to A. E. Staley Manufacturing Co., Decatur, Ill.

Filed Nov. 7, 1972, Ser. No. 304,427
Int. Cl. C08f 19/14, 21/04
U.S. Cl. 260—23 XA 32 Claims

1. A vinylidene chloride copolymer emulsion composition suitable for use as an aqueous based coating vehicle for inhibiting bleeding when woods of a high phenolic wood content are coated therewith, said emulsion composition comprising:

A. a vinylidene chloride copolymer containing:

a. about 40% to about 80% by weight vinylidene chloride,

b. about 20% to 60% by weight of an alkyl ester of an alpha, beta-ethylenically unsaturated acid wherein the alkyl ester group containing from 1 to 8 carbon atoms, and

c. about 0.5 to about 3% by weight of at least one alpha, beta-ethylenically unsaturated monomer selected from the group consisting of an ethylenically unsaturated monocarboxylic acid, an ethylenically unsaturated dicarboxylic acid, an ethylenically unsaturated dicarboxylic acid anhydride, acrylamide, methacrylamide and N-substituted acrylamides,

B. an organic monocarboxylic acid in an amount ranging from at least 3 parts by weight to about 10 parts for each 100 parts by weight vinylidene chloride copolymer dry solids, and

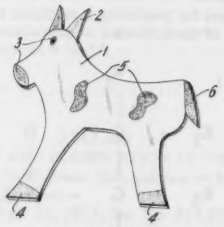
C. an organic acid salt buffering agent in an amount sufficient to buffer the vinylidene chloride copolymer emulsion composition to a pH of about 3.0 to about 6.0.

3,883,456

PLASTIC MASS FOR MODELLING PURPOSES AND A METHOD FOR FORMING IMPRINTS FROM THE MASS

Ludwig C. Finck, Neumarkt, Oberpfalz, Germany, assignor to Firma Eberhard Faber GmbH, Germany

Filed Dec. 29, 1972, Ser. No. 319,681
Int. Cl. C08f 19/14, 21/04
U.S. Cl. 260—23 XA 17 Claims



1. A kneadable coherent mass suitable for modelling purposes, said mass having the following characteristics:

a. it comprises a hydrophobic or hydrophilic filler, a hydrophilic plasticizer, and a coloring agent which is capable of dilution with water;

b. it can be diluted with water;

c. in moist condition it releases and transfers color upon contact;

d. it releasably adheres to substrates.

3,883,457

STABILIZED POLYBUTADIENE RESIN

Delmar F. Lohr, Jr., and Edward Leo Kay, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 16, 1973, Ser. No. 351,688

Int. Cl. C08d *11/04*

U.S. Cl. 260—23.7 R **8 Claims**

1. A composition curable to a hard resin having enhanced resistance to thermo-oxidative deterioration of its mechanical properties, which composition comprises

	Parts by Weight
A butadiene polymer or copolymer resin	100
Vinyltriacetoxysilane	0.05–5.0
Silica	100–500
A substituted ammonium dihydrocarbylphosphorodithioate	0.5–5.0
Calcium stearate	0.5–5.0
Dicumyl peroxide	0.5–6.0

the resin being a homopolymer of butadiene or a copolymer of butadiene and styrene and containing at least 40 percent by weight of butadiene, and at least 80 percent of butadiene repeating units in the 1,2-configuration, and having a molecular weight of 12,500 to 55,000.

3,883,458

FLATTING AGENTS FOR COATINGS

Dietrich-Wolfgang Mueller, Dossenheim; Hans Klug, Frankenthal; Klaus Bronstert, Carlsberg, and Lieselore Grah, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 1, 1974, Ser. No. 438,796

Claims priority, application Germany, Feb. 2, 1973, 2305023

Int. Cl. C08c *11/70*

U.S. Cl. 260—28.5 R **10 Claims**

1. A surface coating containing as a flatting agent the product obtained by reacting

A. a polyolefin wax having a molecular weight of 800 to 25,000 which is a polyethylene wax, a polypropylene wax or an ethylene/propylene copolymer wax, with

B. a vinyl aromatic compound which is styrene or vinyl toluene and

C. a copolymerizable α,β-olefinically unsaturated dicarboxylic anhydride of from 4 to 5 carbon atoms, at a molar ratio of (B):(C) of from 0.7:1 to 1:0.7 and a weight total of (B) plus (C) of from 2 to 50 percent by weight with reference to the weight of the polyolefin was (A) and at a temperature of from 100°C. to 200°C. in the presence or absence of a free-radical polymerization initiator.

3,883,459

THERMOELASTIC ARTICLES AND PROCESS OF MANUFACTURE THEREOF

Eric George Kent, Sarnia, Ontario, Canada, assignor to Polysar Limited, Sarnia, Ontario, Canada

Filed Mar. 7, 1974, Ser. No. 449,036

Claims priority, application Canada, Apr. 18, 1973, 169107

Int. Cl. C08c *11/70*

U.S. Cl. 260—28.5 B **9 Claims**

1. A process of producing a vulcanized thermoelastic composition capable of storing elastic stress which process is preparing a mixture comprising

a. 100 parts by weight of a vulcanizable crystalline elastomer which is selected from a trans-1,4 polymer of a conjugated diolefin compound selected from butadiene-1,3, isoprene and chloroprene and from crystalline copolymers of ethylene with vinyl acetate, said crystalline elastomer having a crystalline melting point of from about 50°C to about 150°C and on X-ray crystallinity of from 5 percent to about 40 percent,

b. from 5 to 100 parts by weight of a crystalline wax having a melting point of from about 40°C to about 100°C and,

c. vulcanizing agent, and vulcanizing the mixture to produce said thermoelastic composition.

3,883,460

STABILIZATION OF POLYBUTADIENE RESIN

Delmar F. Lohr, Jr., and Edward Leo Kay, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 16, 1973, Ser. No. 351,693

Int. Cl. C08d *11/04*

U.S. Cl. 260—23.7 R **4 Claims**

1. A composition curable to a hard resin having enhanced resistance to thermo-oxidative deterioration of its mechanical properties, said composition containing

	Parts by Weight
A butadiene polymer or copolymer resin	100
Zinc diarylphosphinodithioate	0.5–5.0
Calcium stearate	0.5–5.0
A peroxide curing agent	0.5–6.0
Silica	100–500
Vinyl triacetoxysilane	0.05–5.0

the resin being a homopolymer of butadiene or a compolymer of butadiene and styrene and containing at least 40% by weight of butadiene, and at least 80% of butadiene repeating units in the homopolymer or copolymer being in the 1,2-configuration, and having a molecular weight of 12,500 to 55,000; and the curing agent being a peroxide which gives radicals of the structure $R_3(CH_3)CO\cdot$ in which each R represents a hydrocarbon radical containing 1 to 20 carbon atoms.

3,883,461

ETHYLENE/VINYL CHLORIDE COMPOSITIONS

William G. Wagner, Imperial, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 5, 1973, Ser. No. 412,950

Int. Cl. C09j *3/26*

U.S. Cl. 260—27 R **9 Claims**

1. An aqueous dispersion containing a dispersed phase which comprises (1) about 5 to about 65 parts by weight of an ethylene/vinyl chloride interpolymer, and (2) for every part of said interpolymer, 0.05 to 4 parts of rosin material.

3,883,462

NOVEL RESINOUS COMPOSITIONS COMPRISING SEQUENTIAL REACTION PRODUCT OF FORMALDEHYDE, INORGANIC ACID, TRIETHANOLAMINE AND UREA

Glenn A. Pearson, 1311 Delaware Ave. S.W., Washington, D.C. 20024

Filed Jan. 16, 1973, Ser. No. 324,156

Int. Cl. C08g *9/10*

U.S. Cl. 260—29.4 R **5 Claims**

1. A process of producing an aqueous resinous system comprising (1) admixing aqueous formaldehyde and an inorganic catalyzing acid to obtain an exothermic and substantially immediate reaction; (2) adding triethanolamine to said reaction mixture of (1) to obtain an exothermic and substantially immediate reaction; and (3) adding urea to the reaction mixture of (2) to obtain a viscous aqueous resinous solution, said formaldehyde being present in an amount of 30 moles, said catalyzing acid being present in an amount of 2 moles, said triethanolamine being present in an amount of 2 moles, and said urea being present in an amount of 12 moles, it being

permissible to have a variation of no greater than 15 percent in said molar amounts.

3,883,463

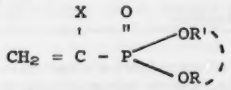
FLAME RETARDANT BINDER FOR FLAMMABLE MATERIALS

Jung Il Jin, Irvington, and Paul Kraft, Spring Valley, both of N.Y., assignors to Stauffer Chemical Corporation, Westport, Conn.

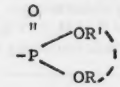
Filed Sept. 27, 1973, Ser. No. 401,533
Int. Cl. C08g *51/24*
U.S. Cl. 260—29.4 UA **11 Claims**

1. A flame retardant polymeric latex binder composition comprising (a) from about 20 to about 70 weight percent of a polymer latex containing:

1. from about 10 to about 75 weight percent of a bis(hydrocarbyl)vinyl phosphonate of the formula:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, phenyl, C_1—C_{18} alkyl and



and each of R and R′ are hydrocarbyl or substituted hydrocarbyl having substituents selected from the group consisting of chloro, bromo, fluoro, nitro, hydroxy, sulfone, ethoxy, methoxy, nitrile, ether, ester and keto groups, said hydrocarbyl or substituted hydrocarbyl having from 1 to 18 carbon atoms,

2. from about 20 to about 85 weight percent of a vinyl halide or vinylidene halide,
3. from about 5 to about 35 weight percent of a C_1–C_{20} alkyl ester of acrylic acid, and optionally,
4. from 0 to about 10 weight percent of a comonomer selected from the group consisting of acrylic acid, methacrylic acid, amides of acrylic acid and methacrylic acid, the N-methylol derivatives of the amides of acrylic acid and methacrylic acid, and diacetone derivatives of the amides of acrylic acid and methacrylic acid, (b) from about 3 to about 50 weight percent of a phosphorus containing compound selected from the group consisting of, a co-condensate of bis(β-chloroethyl)vinyl phosphonate and dimethyl methyl phosphonate, a condensate of bis(β-chloroethyl) vinyl phosphonate, tetrakis(hydroxymethyl)phosphonium chloride or hydroxide, N-hydroxymethyl-3-(dimethylphosphoro)propionamide, tris(2,3-dibromopropylphosphate), and water-insoluble ammonium polyphosphate, water-insoluble ammonium salt of metaphosphoramidic acid and mixtures thereof, said water-insoluble phosphorus compounds being characterized by a water solubility of less than 25 g/100 cc at 10°C., (c) from 0 to about 50 weight percent of urea, (d) from about 10 to about 50 weight percent of an aminoplast selected from the group consisting of a melamine formaldehyde or a urea formaldehyde, and (e) from 0 to about 20 weight percent of a phosphate plasticizer.

3,883,464

STYRENE RESIN COMPOSITION CONTAINING EPOXY LUBRICANTS

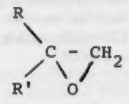
Masaru Higuchi; Hajime Ohnishi, and Hiroshi Yagihara, all of Saitama, Japan, assignors to Daicel Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 212,787, Dec. 27, 1971, Pat. No. 3,817,900. This application July 5, 1973, Ser. No. 376,318
Claims priority, application Japan, Dec. 30, 1970, 45-122245; Nov. 17, 1971, 46-92284
Int. Cl. C08f *45/34*
U.S. Cl. 260—30.4 R **5 Claims**

1. A thermoplastic synthetic resin moldable composition, consisting essentially of

A. a copolymer consisting of (1) at least one first monomer component selected from the group consisting of styrene, α-methyl styrene and nucleus substituted styrenes, and (2) at least one second monomer component selected from the group consisting of acrylonitrile and the methyl, ethyl and butyl esters of acrylic acid and methacrylic acid, said copolymer having blended therein,

B. from 0.01 to 3.0 percent by weight, based on the weight of said copolymer, of one or a mixture of lubricants of the formula



wherein R and R′ each represent hydrogen or straight chain alkyl and the sum of the carbon atoms in R and R′ is 14 to 42.

3,883,465

RAPID SETTING POLYURETHANES FROM DIOLS AND POLYFUNCTIONAL POLYISOCYANATES PREPARED IN THE PRESENCE OF CARBOXYLIC ACID ESTERS

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 358,245, May 7, 1973, Pat. No. 3,801,532, which is a continuation-in-part of Ser. No. 205,647, Dec. 7, 1971, abandoned. This application Dec. 7, 1973, Ser. No. 422,826
Int. Cl. C08g *22/16*
U.S. Cl. 260—31.2 **12 Claims**

1. A rigid, non-cellular composition having a density of at least about 1 gram/cc which is demoldable, without the application of an external source of heat, within about 5 minutes after admixture of the components of the composition which is the reaction product of a polyurethane-forming composition comprising

A. a dihydroxyl-containing compound having a hydroxyl equivalent weight of less than about 250;

B. an organic polyisocyanate having an NCO functionality of at least about 2.5;

C. a liquid modifier compound having a boiling point of at least about 150°C or mixture of such compounds and which moderates the reaction exotherm between components (A), (B) and (D) without substantial reaction therewith selected from esters of carboxylic acids or mixtures thereof; and

D. an organometallic catalyst;

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1, component (C) is present in quantities of from about 10 to about 50 percent by weight of the combined weights of components (A), (B) and (C); and component (D) is present in quantities of from about 0.1 to about 10.0 percent by weight of the combined weight of components (A), (B) and (C).

3,883,466

RAPID SETTING POLYURETHANES FROM DIOLS AND POLYISOCYANATES PREPARED IN THE PRESENCE OF AN ORGANIC CARBONATE

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 358,245, May 7, 1973, Pat. No. 3,801,532, which is a continuation-in-part of Ser. No. 205,697, Dec. 7, 1971, abandoned. This application Dec. 7, 1973, Ser. No. 422,830

Int. Cl. C08g *22/16*

U.S. Cl. 260—32.2 **18 Claims**

1. A rigid, non-cellular composition having a density of at least about 1 gram/cc and an elongation value of less than about 100 percent which is demoldable, without the application of an external source of heat, within about 5 minutes after admixture of the components of the composition which is the reaction product of a polyurethane-forming composition comprising

A. a dihydroxyl-containing compound having a hydroxyl equivalent weight of less than about 250;

B. an organic polyisocyanate having an NCO functionality of at least about 2.5;

C. a liquid modifier compound having a boiling point of at least about 150°C or mixture of such compounds and which moderates the reaction exotherm between components (A), (B) and (D) without substantial reaction therewith selected from the group consisting of organic carbonates and mixtures thereof; and

D. an organometallic catalyst;

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1, component (C) is present in quantities of from about 10 to about 50 percent by weight of the combined weights of components (A), (B) and (C); and component (D) is present in quantities of from about 0.02 to about 5.0 percent by weight of the combined weight of components (A), (B) and (C).

3,883,467

SOLUTIONS OF TETRACHLORINATED AROMATIC POLYESTERS IN METHYLENE CHLORIDE

Robert W. Stackman, Morris Twp., and Clifford M. Vogt, Madison, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 281,585, Aug. 17, 1972. This application July 1, 1974, Ser. No. 485,011

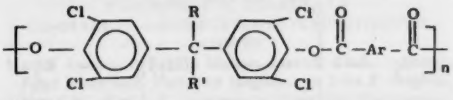
Int. Cl. C08g *51/30;* **D01f** *7/00*

U.S. Cl. 260—33.8 R **9 Claims**

1. A stable solution adapted to form fibers by dry-spinning which solution comprises:

from about **70** to about **82** percent by weight of the solution of methylene chloride; and

from about **30** to about **18** percent by weight of the solution of a polymer having a recurring structural formula:



wherein

n is so chosen that the molecular weight of the polymer is from about **10,000** up to about **200,000** and R and R' may be the same or different and represent lower alkyl groups or hydrogen or may, together, constitute a cyclic hydrocarbon; and Ar is a mixture of from about **20** to about **40** percent paraphenylene and from about **80** to about **60** percent metaphenylene; the stable solution having a viscosity of from about **100** to about **3,000** poises.

3,883,468

THERMOPLASTIC MOLDING COMPOSITIONS

Franz Schmidt, Mannheim; Wolfgang Schenk, Schwetzingen; Rolf Wurmb, Heidelberg; Eugen Meyer-Simon, Frankfurt; Friedrich M. Thurn, Bruehl, and Werner Will, Wolfgang, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 19, 1973, Ser. No. 426,029

Claims priority, application Germany, Dec. 22, 1972, 2262859

Int. Cl. C08g *51/10*

U.S. Cl. 260—37 AL **7 Claims**

1. A thermoplastic molding composition comprising:

a. a polyoxymethylene;

b. from about 15–50 percent by weight of glass fibers; and,

c. from 0.2 to 2.0 percent by weight of a polymeric organosilane adhesion promoter of the formula I

$$X_3Si—R—(OCH_2)_n—O—R^1{}_m—O—R—SiX_3 \quad (I)$$

in which

X denotes halogen, C_{1-7} hydrocarbon-oxy, C_{1-7} acyl-oxy or hydroxyl, the groups X being identical or different,

R denotes straight-chain or branched-chain divalent C_{2-10} hydrocarbon radicals attached to the silicon atom by a silicon-carbon bond which may be interrupted at one or more points by an oxygen atom, the groups R being identical or different,

R^1 denotes C_{2-6} alkylene which may exhibit one or two oxygen bridges,

n is a number between 1 and 5, and

m is a number between approx. 10 and 200.

3,883,469

PROCESS FOR THE PRODUCTION OF POLYAMIDE MOULDINGS

Bert Brassat, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 317,770, Dec. 22, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,804

Claims priority, application Germany, Dec. 24, 1971, 2164483

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 N **3 Claims**

1. In the process for the production of polyamides with reduced residual monomer content by activated anionic polymerization of lactams having at least 5 ring members, the improvement which comprises polymerizing said lactam in the presence of 0.5 to 25% by weight based on the lactam of at least one silicate selected from the group of silicates having sheet structure.

3,883,470

TiO_2 PIGMENTED COATINGS, CREDIT CARD AND PROCESSES RELATING THERETO

John J. Bishop, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Division of Ser. No. 176,737, Aug. 31, 1971, Pat. No. 3,770,478. This application July 12, 1973, Ser. No. 378,484

Int. Cl. C08g *51/04*

U.S. Cl. 260—39 P **5 Claims**

1. A pigmented coating consisting essentially of a dry mixture of TiO_2 pigment in a binder of thermoplastic aminotriazine-sulfonamide-aldehyde resin and ethylene vinyl acetate copolymer or vinyl chloride-maleate copolymer or polyester selected from the group consisting of poly(ethylene succinate), poly(ethylene sebacate), and poly(ethylene terephthalate) wherein the mixture comprises 5 to 45 weight percent of the polyester or the copolymer, 10 to 45 weight percent of the aminotriazine resin and 10 to 85 weight percent of the pigment.

3,883,471

COMPOSITION FOR USE IN THE FORMATION OF THREE-DIMENSIONAL FLAME RETARDANT ARTICLES

Robert W. Stackman, Morristown, and Frank M. Berardinelli, Millington, both of N.J., assignors to Celanese Corporation, New York, N.Y.

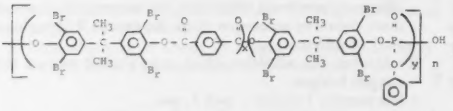
Filed Jan. 10, 1974, Ser. No. 432,372
Int. Cl. C08g *51/58, 17/133*
U.S. Cl. 260—40 R **13 Claims**

1. A molding composition having flame retardant properties when molded into three-dimensional articles comprising an intimate blend of

a. a polyalkylene terephthalate selected from the group consisting of polypropylene terephthalate and polybutylene terephthalate having an inherent viscosity of about 0.2 to 1.4 deciliters per gram,

b. an oxide of antimony, and

c. a brominated aromatic polyphosphate copolymer of the formula



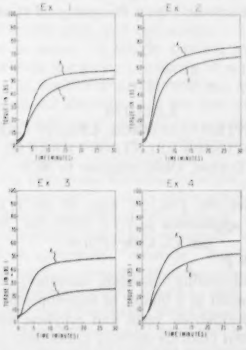
where x = about 1 to 3, y = about 1 to 3, and n = about 2 to 30, with said polymeric brominated aromatic phosphate exhibiting no propensity to exude from said intimate blend during utilization of a three-dimensional article molded therefrom at an elevated temperature of 175°C. for 66 hours.

3,883,472

FAST CURING HEAT STABLE ELASTOMERIC COMPOSITIONS

Robin Nikolas Greene, New Albany, Ind., and Kathrine Johnson Lewis, West Los Angeles, Calif., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 387,050, Aug. 9, 1973, abandoned. This application May 22, 1974, Ser. No. 472,422
Int. Cl. C08f *15/40, 15/16, 45/08*
U.S. Cl. 260—42.52 **10 Claims**



1. An elastomeric composition having good scorch resistance, said composition consisting essentially of

1. a polymeric component which is an acrylic ester/-butenedioic acid monester dipolymer or ethylene/acrylic ester/butenedioic acid monoester terpolymer,

2. a vulcanizing agent selected from polyfunctional, organic, primary amines and their salts, the amount of the polyamine being about 0.06 – 0.30 mole of amino function per kilogram of polymer, and

3. at least one vulcanization accelerator selected from bases and conjugate bases whose K_b at 25°C in water is comprised within the range of 10^{-12} to 10^{6} and which do not cause crosslinking by reaction with ester groups; with the provisos that the acrylic ester is a C_1–C_4 alkyl acrylate or methacrylate; the butenedioic acid monester is a C_1–C_{12} alkyl or C_6–C_{12} aryl monoester; the dipolymer contains about 1–10 weight percent of the butenedioic acid monoester; and the terpolymer contains about 2 to 10 weight percent of the butenedioic acid monoester, and the proportion of all the ester groups in the terpolymer is equivalent to about 2.5 – 8.0 moles of ester groups per kilogram of polymer.

3,883,473

GLASS FIBER REINFORCED POLYVINYL CHLORIDE

Michael E. Kucsma, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 181,625, Sept. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 828,720, May 28, 1969, abandoned. This application Aug. 3, 1973, Ser. No. 385,412
Int. Cl.[2] C08F *45/10*
U.S. Cl. 260—42.18 **10 Claims**

1. A rigid thermoplastic composition consisting essentially of a resin composition comprising about 100 parts by weight of a rigid vinyl chloride homopolymer, about 8 to about 15 parts by weight of a coumarone-indene resin having a ring and ball softening point above about 100°C, and about 5 percent to about 55 percent glass fibers by weight of resin composition.

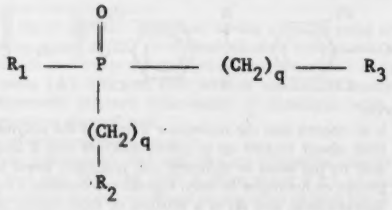
3,883,474

FLAME RESISTANT THERMOPLASTIC POLYESTERS

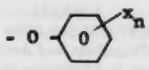
Werner Racky, Wiesbaden, and Hans-Jerg Kleiner, Bad Soden, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 28, 1973, Ser. No. 419,528
Int. Cl. C08g *51/58*
U.S. Cl. 260—45.75 B **10 Claims**

1. A flame-resistant thermoplastic polyester molding composition comprising a linear saturated polyester and a flame-resisting amount of a flame-retarding compound of the general formula:

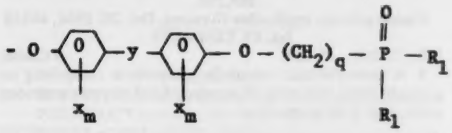


wherein R_1 represents an alkyl radical having from 1 to 6 carbon atoms, R_2 is hydrogen or an aryloxy radical of the formula:

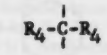


I

R_3 is aryloxy of formula I, or if R_2 is hydrogen, R_3 may have the general structure:



wherein x is Cl or Br, y is -, O, S, SO_2, or



wherein R_4 is hydrogen or alkyl having from 1 to 6 carbon atoms, n is 0 to 5, m is 0 to 4 and q is 1 to 4.

3,883,475

MOULDING COMPOSITION OF THERMOPLASTIC MATERIALS

Werner Racky, Wiesbaden, and Harald Cherdron, Naurod, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 15, 1974, Ser. No. 442,829

Claims priority, application Germany, Feb. 19, 1973, 2308104

Int. Cl. C08f *45/56;* **C08g** *51/56*

U.S. Cl. 260—45.7 P **4 Claims**

1. A moulding composition of thermoplastic material containing from 1 to 20 percent by weight, based on the total weight of moulding composition, of red phosphorus and from 0.2 to 15 percent by weight, based on the weight of red phosphorus, of a substance binding hydrogen phosphide selected from the group consisting of MoS_2, HgO, PbO_2, $AgNO_3$, $HgCl_2$, $FeCl_3 \cdot 6\ H_2O$, CuO, and active carbon.

3,883,476

PYROMELLITIC DIIMIDES OF 3,5-DIALKYL-4-HYDROXYPHENYLSUBSTITUTED AMINES

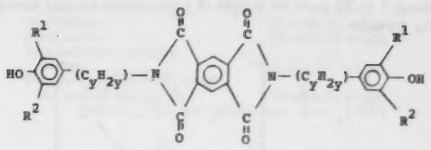
Martin Dexter, Briarcliff Manor; Martin Knell, Ossining; Peter Klemchuk, Yorktown Heights, and John F. Stephen, New City, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 186,499, Oct. 4, 1971, abandoned. This application Nov. 13, 1973, Ser. No. 415,867

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.8 N **9 Claims**

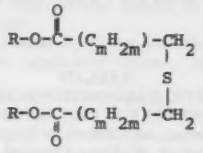
1. A composition of matter stabilized against thermal and oxidative deterioration which comprises an organic polymeric material normally subject to oxidative deterioration containing from 0.005 to 5 percent by weight of a stabilizing compound of the formula



wherein

each of R^1 and R^2 is the same or different lower alkyl group of from 1 to 4 carbon atoms; and

y has a value of from 0 to 3; and from 0 to 2 percent by weight of a co-stabilizer having the formula



wherein

R is a alkyl group having from 6 to 24 carbon atoms; and m is an integer from 1 to 6.

3,883,477

COMPOSITIONS STABILIZED WITH 1,4-DISUBSTITUTED-7-AZABICYCLO (2.2.1) HEPTANE-2,5 OR 2, 6-DICARBOXYLIC ACID ESTERS

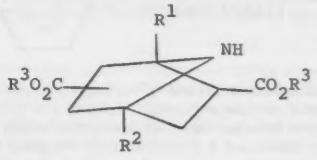
John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,230

Int. Cl. C08f *45/60;* **C08g** *51/60*

U.S. Cl. 260—45.8 N **13 Claims**

1. A composition of matter comprising an organic material normally subject to deterioration stabilized with (a) 0.01 to 5 percent of a stabilizer having the formula



wherein

R^1 is phenyl,

R^2 is phenyl, benzyl or lower alkyl, and

R^3 is alkyl from 1 to 24 carbons,

(b) 0 to 5 percent of a phenolic antioxidant and (c) 0 to 5 percent of a thio co-stabilizer.

3,883,478

FLAME-RETARDANT POLYESTER FIBER COMPOSITIONS

John T. Gresham, Somerset, N.J., assignor to FMC Corporation, New York, N.Y.

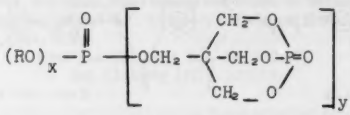
Filed Dec. 7, 1973, Ser. No. 422,841

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.8 R **14 Claims**

1. A flame-retardant polyester fiber composition comprising from about 95 to 80 parts by weight of a fiber-forming linear polyester and, as the flame-retardant additive, from

about 5 to 20 parts by weight of a phosphate triester having the formula



where R is an aryl radical selected from the group consisting of phenyl and naphthyl radicals and phenyl and naphthyl radicals containing 1 to 3 chlorine or bromine atoms and substituted derivatives of said radicals, the substituents being selected from the group consisting of methyl, methoxy, phenyl, phenoxy and phenyl and phenoxy containing 1 to 5 chlorine or bromine atoms and y is an integer from 1 to 3 and x is 3−y.

3,883,479

ABS PLASTIC COMPOSITIONS CONTAINING BIO-PHENOXY FLAME RETARDANTS

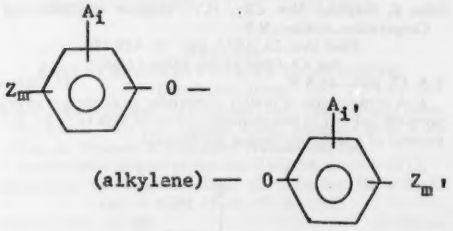
Arnold L. Anderson, and Robert J. Nulph, both of Alma, Mich., assignors to Michigan Chemical Corporation, St. Louis, Mich.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,820

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.9 R **17 Claims**

1. A plastic composition containing acrylonitrile-butadiene styrene polymer having incorporated therein an effective amount of a flame retardant which is a bis-phenoxy compound having the formula:



wherein Z is bromine; *m* and *m'* are integers having a value of 1–4; *i* and *i'* are integers having a value of 1 or 2; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl, or halo- benzyl, with the proviso that when *m* or *m'* is 4, *i* or *i'* respectively is 1.

3,883,480

FLAME AND SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 438,724, Feb. 1, 1974. This application Sept. 3, 1974, Ser. No. 502,294

Int. Cl. C08f *45/56*

U.S. Cl. 260—45.75 C **5 Claims**

1. A flame and smoke retardant composition comprising (1) a vinyl chloride or vinylidene chloride polymer and (2) Cu_3N, said Cu_3N being present in an amount of from about 0.25 to about 10 weight parts per 100 weight parts of polymer and having an average particle size of from about 100 microns to about 0.5 micron.

3,883,481

FIRE-RETARDANT POLYOLEFIN COMPOSITIONS

Kurt Kopetz; Willi Ziegenbein, and Anton Schick, all of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

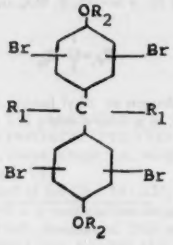
Continuation of Ser. No. 92,943, Nov. 25, 1970, abandoned, and a continuation-in-part of Ser. No. 677,062, Oct. 23, 1967, abandoned. This application July 27, 1973, Ser. No. 383,272

Claims priority, application Germany, Oct. 28, 1966, 40545

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.75 B **6 Claims**

1. A flame-resistant polyolefin composition comprising on a weight basis 100 parts of a polyolefin, 2–9 parts antimony oxide, and 2–20 parts of



wherein R_1 is H or CH_3 and R_2 is dibromoethyl, dibromopropyl or dibromobutyl.

6. A flame-resistant polyolefin composition comprising on a weight basis 100 parts of a polyolefin, 2–9 parts antimony oxide, and 2–20 parts of a compound selected from the group consisting of:

2,2'-bis-[4-(β,γ-dibromobutyric acid ester)-3,5-dibromophenyl]-propane; and

2,2'-bis[4-(α,β-dibromopropionic acid ester)-3,5-dibromophenyl]-ethane.

3,883,482

FLAME AND SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 1, 1974, Ser. No. 438,724

Int. Cl. C08f *45/56*

U.S. Cl. 260—45.75 F **8 Claims**

1. A flame and smoke retardant composition comprising (1) a vinyl chloride or vinylidene chloride polymer and (2) a compound selected from the group consisting of AlB_{12}, MoB_2, TiB_2 and mixtures thereof, said compound being present in an amount of from about 0.25 to about 10 weight parts per 100 weight parts of polymer and having an average particle size of from about 100 microns to about 0.5 micron.

3,883,483

ELECTRODEPOSITABLE CATIONIC THERMOSETTING COATING COMPOSITIONS

Carl C. Anderson, Gibsonia, and Joseph R. Marchetti, Greensburg, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 168,433, Aug. 2, 1971. This application Sept. 24, 1973, Ser. No. 400,493

Int. Cl. C08g *22/32*

U.S. Cl. 260—77.5 TB **5 Claims**

1. A cationic electrodepositable, thermosetting composition comprising:

a. from about 5 to about 50 percent by weight of a secondary or tertiary nitrogen-containing aminoalkyl monomer;
b. from about 5 to about 80 percent by weight of the reaction product of a half-blocked diisocyanate and an ethylenically unsaturated hydroxyl-containing monomer; and
c. from about 0 to about 90 percent by weight of at least one other ethylenically unsaturated monomer.

3,883,484

RAPID SETTING POLYURETHANES FROM DIOLS AND POLYISOCYANATES IN THE PRESENCE OF A HYDROXYL-CONTAINING HALOGENATED ALIPHATIC COMPOUND

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 358,245, May 7, 1973, Pat. No. 3,801,532, which is a continuation-in-part of Ser. No. 205,697, Dec. 7, 1971, abandoned. This application Dec. 7, 1973, Ser. No. 422,829

Int. Cl. C08g *22/16*

U.S. Cl. 260—77.5 MA **16 Claims**

1. A rigid, non-cellular composition having a density of at least about 1 gram/cc which is demoldable, without the application of an external source of heat, within about 5 minutes after admixture of the components of the composition which is the reaction product of a polyurethane-forming composition comprising

A. a dihydroxyl-containing compound having a hydroxyl equivalent weight of less than about 250;
B. an organic polyisocyanate having an NCO functionality of at least about 2.5;
C. a liquid modifier compound or mixture of such compounds and which moderates the reaction exotherm selected from the group consisting of monohydroxyl-containing halogenated aliphatic compounds having an atmospheric boiling point below about 150°C and an OH equivalent weight of less than about 500; **and**
D. an organometallic catalyst;

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1, component (C) is present in quantities of from about 0.1 to about 10 percent by weight of the combined weights of components (A), (B) and (C); and component (D) is present in quantities of from about 0.02 to about 5.0 percent by weight of the combined weight of components (A), (B) and (C).

3,883,485

COPOLYAMIDES CONTAINING CAPROLACTAM, LAURICLACTAM AND HEXAMETHYLENE DIAMINE ADIPATE

Fritz Raabe, Bonn, and Eduard de Jong, Bonn-Beuel, both of Germany, assignors to Plate Bonn Gesellschaft mit beschrankter Haftung, Bonn, Germany

Filed July 31, 1973, Ser. No. 384,370

Claims priority, application Germany, May 12, 1973, 2324159

Int. Cl. C08g *20/10*

U.S. Cl. 260—78 L **12 Claims**

1. A solid copolyamide consisting essentially of recurring units of caprolactam, lauriclactam, hexamethylene diamine adipate and a hexamethylene diamine salt of an aliphatic dicarboxylic acid of the formula

$$HOOC-(CH_2)_n-COOH \quad (I)$$

in which n is the number 7, 8, 10 or 11, said units being incorporated in the copolyamide by polymerisation in the following proportions:

caprolactam	25–35% by weight
lauriclactam	20–40% by weight
hexamethylene diamine adipate	8–25% by weight
hexamethylene diamine salt of the acid of formula (I)	10–40% by weight.

3,883,486

HEAT-RESISTANT POLYMERS BASED ON POLYAMINES AND OLIGOMERS POSSESSING IMIDE GROUPS

Michael Bargain, Lyon, France, assignor to Rhone-Poulenc, S.A., Paris, France

Filed June 21, 1972, Ser. No. 264,723

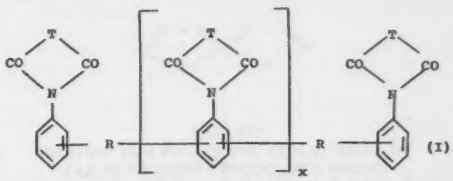
Claims priority, application France, June 24, 1971, 71.23065

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 UA **13 Claims**

1. A heat resistant is heatcurable polymer consisting essentially of a polymeric composition obtained by reacting, between 50° and 350°C.,

a. an oligomer having the average general formula:

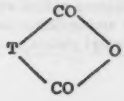


(I)

in which x represents a number from 0.1 to about 2, R represents a divalent hydrocarbon radical with 1 to 8 carbon atoms, which is derived from an aldehyde or a ketone of the general formula:

$$O=R \quad (II)$$

in which the oxygen atom is bonded to a carbon atom of the radical R, and T represents a divalent organic radical possessing 2 to 24 carbon atoms, the free valencies of which are on adjacent carbon atoms and which is derived from an internal anhydride of the general formula:



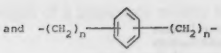
(III)

at least 60 percent of the T radicals in the oligomer containing a polymerisable carbon-carbon double bond optionally substituted by chlorine atoms or methyl groups, the remaining T radicals, if any, being alkylene, cycloalkylene, phenylene or naphthylene radicals, with (b) a polyamine of the general formula:

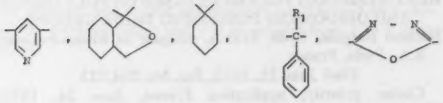
$$Q(NH_2)_y$$

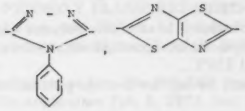
in which y represents an integer at least equal to 2 and Q represents

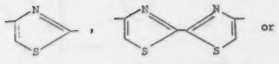
a divalent organic radical E selected from a linear or branched alkylene radical with less than 13 carbon atoms, a phenylene radical, a cyclohexylene radical, radicals of the formulae:

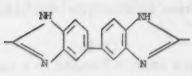
and 

wherein *n* represents an integer from 1 to 3, a radical consisting of a plurality of phenylene or cyclohexylene radicals connected to one another by a simple valency bond or by —O— or —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, —SO_2—, —CONH—, —COO—, —$P(O)R_1$—, —CONH—X—NHCO—,

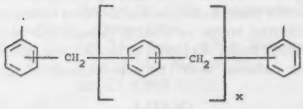





or



wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms, a phenyl radical or a cyclohexyl radical, and X represents an alklyene radical with less than 13 carbon atoms, said phenylene and cyclohexylene radicals optionally being substituted by methyl groups, and a 2- to 4-valent radical of the formula:



in which *x* represents a number from 0.1 to 2, the relative amounts being such that the oligomer supplies 1.1 to 50 T radicals containing a polymerisable carbon-carbon double bond per —NH_2 group supplied by the polyamine.

3,883,487

COPOLYAMIDES CONTAINING CAPROLACTAM, LAURICLACTAM AND 11-AMINOUNDECANOIC ACID

Fritz Raabe, Bonn, and Eduard de Jong, Bonn-Beuel, both of Germany, assignors to Plate Bonn Gesellschaft mit beschrankter Haftung, Bonn, Germany

Filed Jul. 31, 1973, Ser. No. 384,371

Claims priority, application Germany, May 12, 1973, 2324160

Int. Cl. C08g *20/10*

U.S. Cl. 260—78 L **12 Claims**

1. A solid copolyamide consisting essentially of recurring units of caprolactam, lauriclactam, 11-aminoundecanoic acid and a hexamethylene diamine salt of an aliphatic dicarboxylic acid corresponding to the formula

$$HOOC—(CH_2)_n—COOH \quad (I)$$

in which *n* is 4, 7, 8, 10 or 11, wherein said units are incorporated in the copolyamide in the following proportions:

caprolactam	20–40% by weight
lauriclactam	20–35% by weight
11-aminoundecanoic acid	15–35% by weight
hexamethylene diamine salt of the acid formula (I)	15–40% by weight.

3,883,488

2-VINYL-(9-DICYANOMETHYLENE) FLUORENE AND DERIVATIVES THEREOF

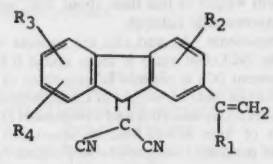
James M. Pearson, Webster, and John F. Yanus, Fairport, both of N.Y., assignors to Xerox Corporation

Filed Oct. 31, 1973, Ser. No. 411,578

Int. Cl. C08f *7/02*

U.S. Cl. 260—78.4 N **13 Claims**

1. A composition of matter characterized by the structural formula:



wherein R_1 is H or methyl and R_2, R_3 and R_4 are H, halogen or aliphatic groups having from 1 to 4 carbon atoms.

3,883,489

PROCESS FOR THE PREPARATION OF A DISPERSIBLE VINYL ACETATE/ETHYLENE POLYMER POWDER

Klaus Matschke, Hausen; Karl Josef Rauterkus; Detlev Seip, both of Kelkheim, Taunus, and Wolfgang Zimmermann, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 19, 1973, Ser. No. 342,492

Claims priority, application Germany, Mar. 24, 1972, 2214410

Int. Cl. C08f *1/11, 1/88, 15/02*

U.S. Cl. 260—78.5 R **3 Claims**

1. A process for the preparation of a free-flowing and easily dispersible polymer powder comprising a copolymer of vinyl acetate and ethylene and optionally at least one further olefinically unsaturated monomer, wherein said copolymer is dried in a tower as an aqueous dispersion prepared by copolymerization of the monomers in an aqueous system at an ethylene pressure of up to 100 atmospheres and in the presence of from 0 to 1 % by weight, calculated on the polymer, of an ionic

emulsifier, the improvement comprising adding to said aqueous system from 5 to 20 % by weight, calculated on the polymer, of at least one polyvinyl alcohol with a degree of saponification of from 80 to 92 mol % and a viscosity of a 4 % aqueous solution of said polyvinyl alcohol at 20°C from 3 to 35 cP, said copolymerization being in the presence of a free radical initiator in said aqueous system, and spray drying said aqueous dispersion by simultaneously introducing into a spray-drying tower at least one dry anticaking agent selected from the group consisting of aluminium silicate, silica and calcium carbonate in an amount of from 3 to 30 % by weight, calculated on the solids content of the aqueous dispersion, said anticaking agent having an average particle size of from 0.01 to 0.5 μ.

3,883,490

RESINS CONTAINING DITHIOIC ACID GROUPS

Yasuo Fujimoto, Yokohama; Isao Masumura, and Yukio Hashimoto, both of Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Filed May 15, 1973, Ser. No. 360,419

Claims priority, application Japan, May 22, 1972, 47-49859

Int. Cl. C08f *27/06*

U.S. Cl. 260—79.5 NV **5 Claims**

1. A resin comprising a cross-linked copolymer of aromatic vinyl compounds having at least one sulfur-containing group selected from the group consisting of a dithioic acid group and an alkyl group having a dithioic acid group bonded to at least some aromatic nucleui of said copolymer.

3,883,491

NOVEL N-3-AMINOALKYL AMIDES, POLYMERS THEREOF, AND METHOD FOR THEIR PREPARATION

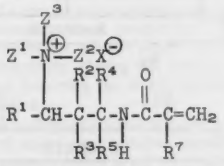
Donald I. Hoke, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Division of Ser. No. 832,412, June 11, 1969, Pat. No. 3,666,810. This application Dec. 1, 1971, Ser. No. 203,853

Int. Cl. C08f *3/90, 15/02*

U.S. Cl. 260—85.5 R **8 Claims**

1. A polymer of a compound of the formula



wherein each of R^1, R^2 and R^3 is hydrogen or a hydrocarbon radical; each of R^4 and R^5 is a hydrocarbon radical; R^7 is hydrogen or a lower alkyl radical; X is a salt-forming anion; each of Z^1 and Z^2 is a lower alkyl or C_{3-8} cycloalkyl radical, or

is a heterocyclic radical; and Z^3 is hydrogen or a lower alkyl radical.

3,883,492

PROCESS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF OLEFINS

Andre Delbouille, and Jean-Louis Derroitte, both of Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Jan. 13, 1969, Ser. No. 790,832

Claims priority, application France, Jan. 17, 1968, 68.136374

Int. Cl. C08f *1/56;* **B01j** *11/84*

U.S. Cl. 260—88.2 R **19 Claims**

1. Process for the polymerization and copolymerization of α -olefins which comprises carrying out said polymerization and copolymerization in the presence of a catalyst comprising an organometallic compound of a metal of Groups I, II, III and IV of the Periodic Table and the product obtained by reacting in the liquid phase a transition metal derivative selected from the group consisting of the halides, oxyhalides, alkoxyhalides, oxyalkoxides and alkoxides of the metals of Groups IVb, Vb, and VIb of the Periodic Table and an anhydrous solid support consisting of a hydroxide of the formula $M(OH)_2$ in which M is selected from the group consisting of magnesium, chromium, manganese, iron, nickel, cobalt, copper, zinc and cadmium, said transition metal derivative and said hydroxide being initially mixed under conditions which prevent overheating leading to solidification of the reaction mixture.

3,883,493

METHOD FOR PRODUCING COPOLYMERS OF 1-OLEFINS WITH CONJUGATED DIENES

Takashi Yamao, and Shujiro Shiga, both of Chiba, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka-Shi, Japan

Filed May 10, 1973, Ser. No. 359,069

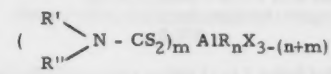
Claims priority, application Japan, May 10, 1972, 44-46676

Int. Cl. C08f *1/42, 15/04;* **C08d** *3/04*

U.S. Cl. 260—85.3 R **20 Claims**

1. A method for preparing copolymers of 1-olefins with conjugated dienes, which comprises copolymerizing at least one 1-olefin with at least one conjugated diene using a catalyst composition comprising:

A. at least one dithiocarbamate-containing organoaluminum compound represented by the following formula



wherein

each of R′, R″ and R is an organic group containing 1 to 20 carbon atoms, X is a halogen atom, m is not less than 0.05, n is not less than 0.5, and $n + m$ is not more than 3, or a mixture thereof with at least one organoaluminum compound represented by the following formula

AlR_3 or AlR_yX_{3-y}

wherein R is an organic group containing 1 to 20 carbon atoms, X is a halogen atom, and y is more than 0 but less than 3, and

B. at least one transition metal compound selected from the group consisting of vanadium or titanium halides, alcoholates, acetyl acetonates, salicylates and cyclopentadienyl compounds.

3,883,494
PROCESS FOR THE PREPARATION OF EMULSIFIER-CONTAINING POLYVINYL CHLORIDE OR VINYL CHLORIDE COPOLYMER POWDERS

Hermann Winter, Marl; Manfred Smolinski, Rhade; Hans-Georg Wolf, Marl; Harry Roll, Marl; Kurt Hoffmann, Recklinghausen, and Helmut Jacob, Marl, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Sept. 14, 1972, Ser. No. 288,972

Claims priority, application Germany, Sept. 18, 1971, 2146753

Int. Cl. C08f *1/88*

U.S. Cl. 260—92.8 A **11 Claims**

1. In a process for preparing powdery, emulsifier-containing vinyl chloride polymer particles suitable for use in the manufacture of plastisols by spray drying an aqueous dispersion of said polymer with a carrier gas through a two-fluid atomizer into a water-evaporating atmosphere, the improvement which comprises spraying with 1.6–5.0 kg of carrier gas per kg of said dispersion to form dry powdery polymer particles containing less than 2 wt.% particles having a diameter greater than 40 μ.

3,883,495
PROCESS AND CATALYST FOR RING OPENING POLYMERISATION

Dieter Maertens; Gunther Lehnert, both of Leverkusen, and Manfred Zimmermann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 4, 1973, Ser. No. 347,775

Claims priority, application Germany, Apr. 8, 1972, 2217048

Int. Cl. C08f *1/56*

U.S. Cl. 260—93.1 **3 Claims**

1. A process for polymerizing a cyclic olefin having 4, 5, 7, 8 or more ring carbon atoms and 1 carbon-to-carbon double bond or a plurality of non-conjugated carbon-to-carbon double bonds in the ring, said process comprising contacting said cyclic olefin with a catalyst of

a. a molybdenum halide or oxyhalide,

b. an ester of the formula

$$R_1—O—R_2$$

wherein

R_1 and R_2 are alkyl having 1 to 12 carbon atoms, cycloalkyl having 5 to 10 carbon atoms, aryl having 6 to 20 carbon atoms or aralkyl having 1 to 6 carbon atoms in the alkyl moiety and 6 to 10 carbon atoms in the aryl moiety or R_1 and R_2 together with the oxygen to which they are attached form a 5- to 7-membered ring,

c. an organo aluminum compound of the formula

$$AlX_nR_{3-n}$$

wherein

R is alkyl having 1 to 12 carbon atoms, cycloalkyl having 5 to 10 carbon atoms, aryl having 6 to 20 carbon atoms or alkaryl having 7 to 20 carbon atoms, X is hydrogen, halogen or alkoxy having 1 to 10 carbon atoms and n is 0, 1, 1.5 or 2,

d. a Lewis acid and

e. elementary iodine

at a temperature of −50° to 50°C. and recovering resulting polymer, the molar ratio of a):b) being 1:0.1 to 1:10, the molar ratio of (a):(c) being 1:0.1 to 1:10, the molar ratio of (a):(d) being 1:0.1 to 1:10, said elementary iodine being present in an amount of 0.25 to 4 mmols per mol of molybdenum and said catalyst being present in an amount of from 0.01 to 10 mmol per 100 g. of cyclic olefin.

3,883,496
PROCESS FOR THE MANUFACTURE OF INSULIN, ANALOGS AND DERIVATIVES THEREOF

Rolf Geiger, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt (Main), Germany

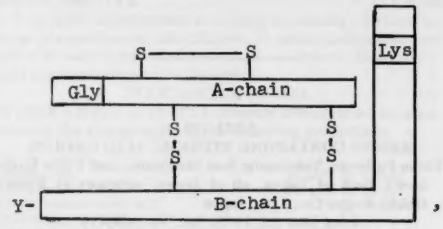
Filed Oct. 23, 1973, Ser. No. 408,913

Claims priority, application Germany, Oct. 25, 1972, 2252157

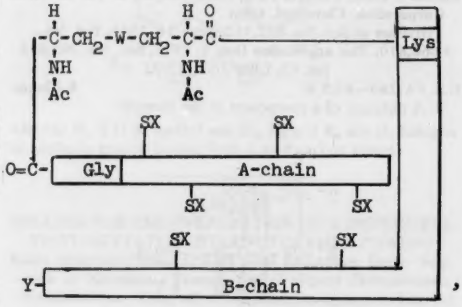
Int. Cl. A61k *17/04*; C07c *103/52*

U.S. Cl. 260—112.7 **2 Claims**

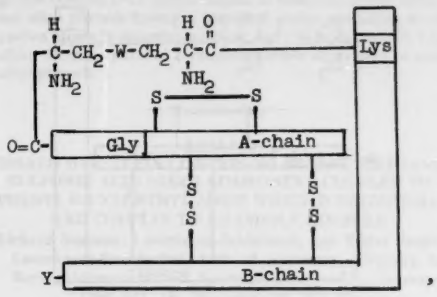
1. A method for making an insulin compound of the formula



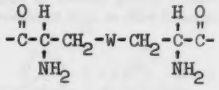
wherein Y is hydrogen, alkanoyl having 1 to 4 carbon atoms, phenyl-alkanoyl having 1 to 3 carbon atoms in the alkanoyl portion, benzoyl, alkyloxy-carbonyl or aralkyloxy-carbonyl having 1 to 4 carbon atoms in the alkyl portion, or aminoacyl derived from a naturally-occurring α- or β-amino acid or from the D-enantiomer thereof, and biologically-active analogs thereof in which one or more amino acids have been exchanged for other, preferably simpler, amino acids or in which the chains are modified, preferably shortened, in length, which process comprises cleaving N-protective and S-protective groups from a compound of the formula



or analogs thereof in which one or more amino acids have been exchanged for other, preferably simpler, amino acids or in which the chains are modified, preferably shortened, in length wherein Ac is an N-protective group cleaved by proton solvolysis, X is hydrogen or an S-protective group, and W is $(CH_2)_n$—, where n is an integer from zero to four, or is —S—, —S—CH_2—, —CH_2—S—CH_2—, —SO_2—, —SO_2—CH_2—, or —CH_2—SO_2—CH_2—, dehydrogenating —SH groups in the resultant product to form S—S bonds, whereby a compound of the formula



or an aforementioned analog therof, is obtained, and then subjecting the last-mentioned compound or analog to Edman degradation to remove the



bridge therefrom.

3,883,497

POLYPEPTIDES FROM UROGASTRONE

Harold Gregory, and Ian Robert Willshire, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 29, 1973, Ser. No. 410,557

Claims priority, application United Kingdom, Nov. 29, 1972, 55089/72

Int. Cl. C07g *7/00;* **C08h** *1/00;* **C07g** *15/00*

U.S. Cl. 260—112 R **3 Claims**

1. A process for the fractionation of crude urogastrone into three components which comprises the steps of:

a. applying a sample of a urogastrone preparation having a specific activity as defined above of 5–10 μg./kg. to a column of carboxymethyl cellulose equilibrated with an 0.01 molar aqueous buffer of pH 4.5, eluting the column with a buffer of pH 5.0 with a concentration gradient of 0.01 molar to 0.5 molar, and collecting the eluted material showing the biological activity,

b. applying the biologically active material from step (a) to a column of a porous polyacrylamide gel excluding molecules of molecular weight greater than 5,000 in an 0.05 molar aqueous buffer solution of pH 7.2 and composed of volatile components, eluting the column with the same solution, and collecting the eluted material showing the biological activity,

c. applying the biologically active material from step (b) to a column of aminoethyl cellulose equilibrated with an 0.01 molar aqueous buffer of pH 5.5 composed of volatile components, eluting the column with a buffer of the same molarity and then with a buffer having a concentration gradient of from 0.01 molar to 0.3 molar, detecting the presence of three peaks of eluted material each showing the biological activity and collecting, from the first eluted peak material which contains α-urogastrone, from the second eluted peak material which contains β-urogastrone, and from the third eluted peak material which contains γ-urogastrone, followed by, in the case of material from the peak from step (c) containing β-urogastrone, applying the material to a column of carboxymethyl cellulose equilibrated with an 0.01 molar aqueous buffer of pH 5.0, eluting the column with a buffer of pH 5.0 with a concentration gradient of from 0.01 molar to 0.5 molar, collecting the eluted material showing the biological activity, applying this material to a column of a porous polyacrylamide gel excluding molecules of molecular weight greater than 5,000 in an 0.05 molar aqueous buffer of pH 7.2 and composed of volatile components, eluting the column with the same solution and collecting the eluted material showing the biological activity: or followed by in the case of material from the peak from step (c) containing γ-urogastrone, applying the material to a column of carboxymethyl cellulose equilibrated with an 0.01 molar aqueous buffer of pH 4.8, eluting the column with a buffer of pH 4.8 with a concentration gradient of from 0.01 molar to 0.5 molar, collecting the eluted material showing the biological activity, applying this material to a column of a porous polyacrylamide gel excluding molecules of molecular weight greater than 5,000 in an 0.05 molar aqueous buffer of pH 7.2 and composed of volatile components, eluting the column with the same solution and collecting the eluted material showing the biological activity.

3,883,498

[ILE², LEU⁴]-VASOPRESSIN ANALOGS

Dieter Gillessen, Birsfelden; Josef Rudinger, Zurich, and Rolf Studer, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

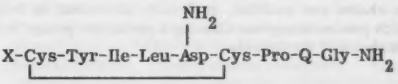
Filed Sept. 7, 1973, Ser. No. 395,105

Claims priority, application Switzerland, Sept. 21, 1972, 13083/72

Int. Cl. C07c *103/52;* **C07g** *7/00;* **A61k** *27/00*

U.S. Cl. 260—112.5 **13 Claims**

1. A compound of the general formula



wherein X is the residue of a naturally occurring amino acid or of a linear peptide of 2–6 amino acids selected from leucine and glycine and Q is the residue of arginine or lysine and wherein all amino acids with an asymmetric center have the L-configuration

and pharmaceutically acceptable non-toxic acid addition salts thereof.

3,883,499

PEPTIDE AND PROCESS FOR PREPARING SAME FROM FROG SKIN

Shinro Tachibana, Narashino, and Kengo Araki, Niiza, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1973, Ser. No. 386,538

Claims priority, application Japan, Aug. 18, 1972, 47-82103

Int. Cl. C07c *103/52;* **C07g** *7/00;* **A61k** *27/00*

U.S. Cl. 260—112.5 **1 Claim**

1. An octapeptide compound consisting of the following amino acids arranged in the following order and wherein the configurations of all the amino acids are L:

pyroglutamic acid.glycine.lysine.arginine.proline.
tryptophan.isoleucine.leucine.

3,883,500
PROCESS FOR THE MANUFACTURE OF INSULIN, ANALOGS AND DERIVATIVES THEREOF

Rolf Geiger, Frankfurt am Main, and Georg Jager, Neuenhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

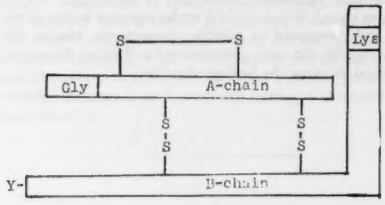
Filed Oct. 29, 1973, Ser. No. 410,310

Claims priority, application Germany, Oct. 31, 1972, 2253327

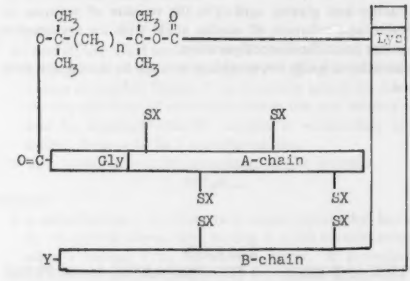
Int. Cl. C07c *103/52;* **A61k** *17/04;* **C07g** *7/00*

U.S. Cl. 260—112.7 **2 Claims**

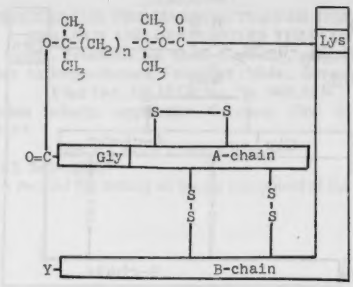
1. A method for making an insulin compound of the formula



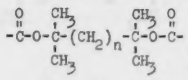
wherein Y is hydrogen, alkanoyl having 1 to 4 carbon atoms, phenyl-alkanoyl having 1 to 3 carbon atoms in the alkanoyl portion, benzoyl, alkyloxy-carbonyl or aralkyloxy-carbonyl having 1 to 4 carbon atoms in the alkyl portion, or aminoacyl derived from a naturally-occurring α- or β-amino acid or from the D-enantiomer thereof, and biologically-active analogs thereof in which one or more amino acids have been exchanged for other, preferably simpler, amino acids or in which the chains are modified, preferably shortened, in length, which process comprises cleaving S-protective groups from a compound of the formula



or analogs thereof in which one or more amino acids have been exchanged for other, preferably simpler, amino acids or in which the chains are modified, preferably shortened, in length, wherein X is hydrogen or an S-protective group and n is an integer from two to four, dehydrogenating -SH groups in the resultant product to form S-S bonds, whereby a compound of the formula



or an aforementioned analog thereof, is obtained, and then treating this compound with an acid to remove the



bridge therefrom.

3,883,501
SULFURIZED PHENOLIC MATERIALS

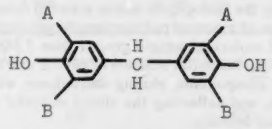
Robert E. Malec, Birmingham, and Larry Plonsker, Bloomfield Hills, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Sept. 19, 1973, Ser. No. 398,644

Int. Cl. C07g *17/00*

U.S. Cl. 260—137 **10 Claims**

1. A sulfurized product made by the process comprising heating to a temperature of about 50°–200°C a mixture of (a) about 0.5–10 parts by weight of sulfur, and (b) about 100 parts by weight of a reaction product, said reaction product comprising a major amount of a mixture of methylenebis phenols, said mixture comprising (1) a substantial amount of at least one symmetrical methylenebis phenol having identically substituted phenol radicals and having the formula:



wherein A is a tert-alkyl group having from 4 to about 12 carbon atoms and B is selected from the group consisting of hydrogen and alkyl groups having 1–12 carbon atoms, and (2) a substantial amount of at least one asymmetrical methylenebis phenol having different phenol radicals and having at least one ortho-tert-alkyl group containing from 4–12 carbon atoms, said reaction product being made by reacting in the presence of an alkali metal hydroxide catalyst (i) one mole part of a mixture of alkyl phenols, said mixture containing at least two different alkyl phenols, each of said different alkyl phenols having a hydrogen atom available in an ortho or para position, said different alkyl phenols being selected from the group consisting of 2-alkyl phenols, 2,6-dialkyl phenols and 2,4-dialkyl phenols wherein said alkyl groups contain 1–12 carbon atoms, the remaining components of said mixture consisting mainly of 2,4,6-tri-alkyl phenol wherein said alkyl

groups contain 1–12 carbon atoms, at least one of said different alkyl phenols having a tert-alkyl group containing 4–12 carbon atoms in an ortho position, and (ii) from about 0.3 to about 10 mole parts of formaldehyde per equivalent of said alkyl phenols.

3,883,502

DISAZO DYESTUFFS COMPRISING PHENYL METHANE SULFONIC ACID DIAZO COMPONENT COUPLED TO PHENYL OR NAPHTHYL ANINE WHICH IS DIAZOTIZED AND COUPLES TO AN INDOLE COUPLER

Richard Sommer, Leverkusen-Schlebusch, and Edgar Siegel, Leverkusen-Steinbuchel, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

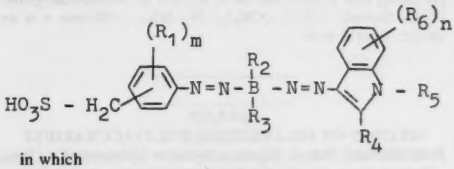
Filed Apr. 10, 1972, Ser. No. 242,787

Claims priority, application Germany, Apr. 10, 1971, 2117462

Int. Cl. C09b *31/14*; **D06p** *3/24*

U.S. Cl. 260—165 **7 Claims**

1. Disazo dyestuff, which in the form of the free acid, has the formula



in which

B is 1,4-phenylene or 1,4-naphthylene;

R_1 is hydrogen, chlorine, bromine, C_1-C_4-alkyl, cyanoethyl, C_1-C_6-alkoxy, hydroxyethoxy, benzyloxy or nitro;

R_2 and R_3 are hydrogen, chlorine, bromine, C_1-C_6-alkoxy, β-hydroxyethoxy, benzyloxy, C-C_4-alkyl, or cyanoethyl;

R_4 is C_1-C_4-alkyl; phenyl; naphthyl; biphenylyl; or phenyl, naphthyl or biphenylyl substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, chlorine or bromine;

R_5 is hydrogen; C_1-C_4-alkyl; or C_1-C_4-alkyl substituted by cyano, carbonamido or carboxyl; R_6 is C_1-C_4-alkyl, cyanoethyl, C_1-C_6-alkoxy, hydroxyethoxy, benzyloxy, halogen, nitro, sulfo or cyano;

m is 1 or 2; and

n is 0, 1 or 2.

3,883,503

4-(2-NITRO-4-SULFO- OR OPTIONALLY SUBSTITUTED SULFAMOYLANILINO)PHENYL-AZO-PHENYL DYES

Daniel Van Assche, Binningen, Basel-Land, and Hanspeter Uehlinger, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

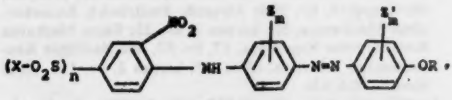
Filed Oct. 10, 1972, Ser. No. 296,441

Claims priority, application Switzerland, Oct. 13, 1971, 14978/71

Int. Cl. C09b *29/34*

U.S. Cl. 260—206 **24 Claims**

1. A compound of the formula



or a salt thereof,

wherein

R is alkyl of 1 to 6 carbon atoms or sulfoalkyl of 1 to 6 carbon atoms,

X is —OH or —NHR_1,

wherein

R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxyalkyl wherein the alkoxy and alkyl radicals independently have 1 to 6 carbon atoms each, phenyl or substituted phenyl having 1 or 2 substituents wherein each substituent is independently halo, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms,

each Z and each Z' is independently halo, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms,

each *m* is independently 0, 1 or 2,

n is 0 or 1, and

each halo is independently chloro or bromo, with the proviso that when R is alkyl, X must be -OH and n must be 1.

3,883,504

WATER-INSOLUBLE CARBONYLALKYLENE SULFONAMIDO CONTAINING AZO DYESTUFFS

Rodolf Schickfluss, Frankfurt am Main, and Willi Steckelberg, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

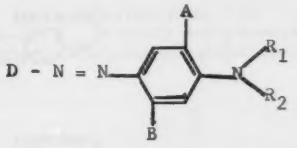
Filed Jan. 30, 1973, Ser. No. 328,064

Claims priority, application Germany, Feb. 3, 1972, 2205062

Int. Cl. C09c *29/06, 29/34*

U.S. Cl. 260—207.1 **9 Claims**

1. A compound of the formula

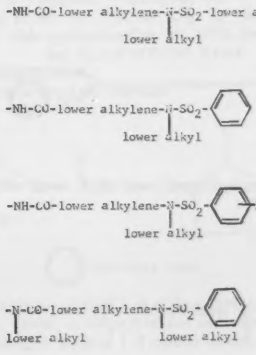


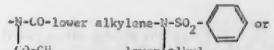
in which

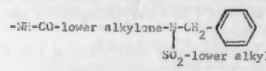
D represents nitro-phenylene, dinitro-phenylene, carbo-lower alkoxy-phenylene, chloro-nitro-phenylene, cyano-nitrophenylene, dichloro-nitro-phenylene, chloro-bromo-nitro-phenylene, chloro-dinitro-phenylene, bromo-dinitro-phenylene, chloro-lower alkyl sulfonyl-phenylene, nitro-lower alkylsulfonyl-phenylene, bromo-cyano-nitro-phenylene, chloro-trifluoromethyl-phenylene, phenylazo-phenylene,

A represents hydrogen, chlorine, lower alkyl, lower alkoxy or —O—lower alkylene-lower alkoxy,

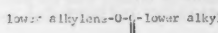
B represents hydrogen, chlorine, lower alkyl, lower alkoxy, lower alkloylamino, benzoylamino,

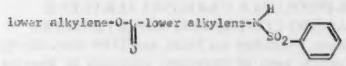


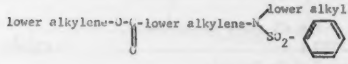


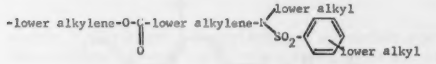


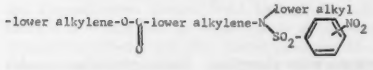
R_1 represents lower alkyl, lower alkylene-OH,

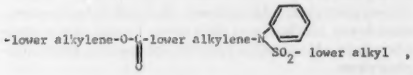


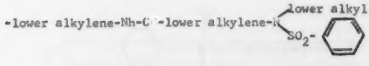




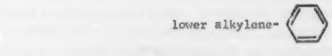


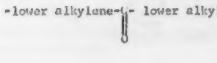


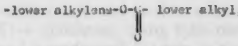


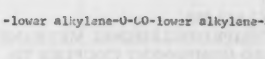


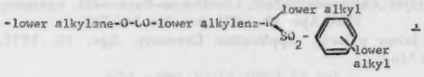
and R_2 represents hydrogen, lower alkyl, -lower alkylene-OH, lower alkylene-CN,











providing that at least one of B, R_1, and R_2 contain the group of the formula $-CO-(CH_2)_n-N-SO_2-$, wherein n is an integer from 1 to 6.

3,883,505

METHOD OF SOLUBILIZING POLYSACCHARIDES

Junji Hamuro, Tokyo, Japan, assignor to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 378,705, July 12, 1973, abandoned. This application May 20, 1974, Ser. No. 471,189

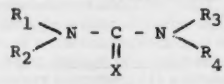
Claims priority, application Japan, July 17, 1972, 47-71454

Int. Cl. C07c *3/00*

U.S. Cl. 260—209 R **8 Claims**

1. A method of improving the solubility of a polysaccharide poorly soluble in water which comprises:

a. contacting said polysaccharide with an aqueous solution of at least two moles per liter of a compound of the formula



wherein R_1, R_2, R_3, and R_4 are selected from the group consisting of hydrogen and alkyl having up to four carbon atoms, and X is oxygen, sulfur, or NH until said polysaccharide is dissolved in said solution; and

b. recovering said polysaccharide in water-soluble form from said solution.

3,883,506

CHROMOMYCINONE GLYCOSIDE

Jury Vasilievich Zhdanovich, Khoroshevskoe shosse, 5, korpus 8, kv. 21; Galina Borisovna Lokshin, Balaklavsky prospekt, 20, korpus 3, kv. 206; Alexandr Dmitrievich Kuzovkov, ulitsa Vinokurova, 5/6 korpus 2, kv. 33; Sarra Markovna Rudaya, ulitsa Nagornaya, 17, kv. 57, and Nadezhda Konstantinovna Solovieva, ulitsa, 18, korpus 2, kv. 151, all of Moscow, U.S.S.R.

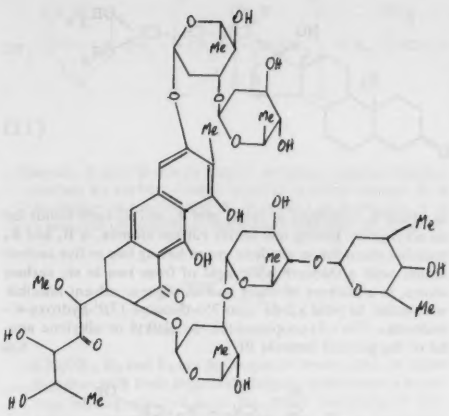
Continuation of Ser. No. 60,917, Aug. 4, 1970, abandoned. This application Jan. 24, 1974, Ser. No. 436,360

Claims priority, application U.S.S.R., Aug. 4, 1969, 1355862

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 AB **1 Claim**

1. A glycoside represented by the formula:



3,883,507
NOVEL ESTERS OF MEGALOMICIN A AND PROCESSES FOR THEIR PREPARATION

Hans Reimann, Wayne, and Robert S. Jaret, Livingston, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

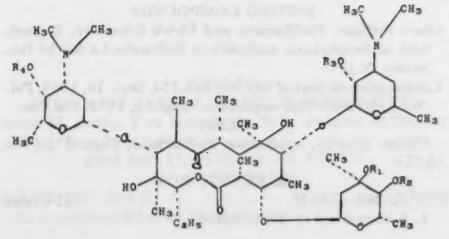
Continuation-in-part of Ser. No. 109,632, Jan. 25, 1971, abandoned. This application Mar. 28, 1974, Ser. No. 455,751

Int. Cl. C07c *129/18*

U.S. Cl. 260—210 AB **15 Claims**

1. A process which comprises treating a 3'-hydroxymegalomicin A starting compound selected from the group consisting of megalomicin A, 4'-monoacylmegalomicin A, 2'',4'''-diacylmegalomicin A and 4',2'',4'''-triacylmegalomicin A, each of said acyl radicals being derived from a hydrocarbon carboxylic acid having from 2 to 18 carbon atoms, with an excess of an acid anhydride of a hydrocarbon carboxylic acid having from 2 to 18 carbon atoms in a basic medium at a temperature in the range of from about 60° to about 120°C,

whereby is formed a 3',4',2'',4'''-tetraacyl ester derivative of megalomicin A having the following structural formula:



wherein R_1, R_2, R_3 and R_4 are each an acyl radical of a hydrocarbon carboxylic acid having from 2 to 18 carbon atoms and wherein, when said 3'-hydroxymegalomicin A starting compound also has a 4'-acyl derivative, R_2 is the acyl radical of said acid anhydride reagent and R_1 is the acyl radical originally in the 4'-position of the 3'-hydroxy-4'-acylmegalomicin A starting compound.

3,883,508
PROCESS FOR THE PREPARATION OF GUANOSINE TETRA- AND PENTA-PHOSPHATES AND PRODUCTS

Alan Frederick Cook, Cedar Grove, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 13, 1973, Ser. No. 369,657

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **11 Claims**

6. Guanosine 5'—S—C_1–C_7 alkyl phosphorothioate-2',3'-cyclic phosphate and its base addition salts.

3,883,509
SUBSTITUTED O-[AMINOSULFONYL]-GLYCOLIC AMIDES

Adolf Fischer, Mutterstadt, and Wolfgang Rohr, Mannheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany

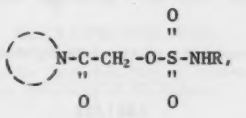
Filed Apr. 16, 1973, Ser. No. 351,240

Claims priority, application Germany, Apr. 22, 1972, P2219923.1

Int. Cl. C07d *41/04, 27/04, 29/34*

U.S. Cl. 260—239 B **9 Claims**

1. A substituted O-[aminosulfonyl]-glycolic amide of the formula



where R denotes hydrogen, alkyl of one to six carbon atoms, cyclopentyl, cyclohexyl or haloalkyl of one to six carbon atoms and the carbonamide nitrogen is a member of an unsubstituted or lower-alkyl-substituted tetramethylenimine, pentamethylenimine, hexamethylenimine, heptamethylenimine, octamethylenimine, or 3-azabicyclo-[3,2,2]-**nonane ring.**

3,883,510
CARBAMATE ESTERS OF 2-OXYIMINO-3-KETO-1,4-DIHETEROCYCLICS

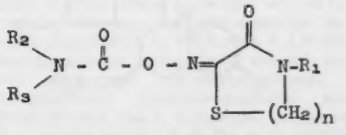
Russell F. Bellina, Claymont, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 171,388, Aug. 12, 1971, Pat. No. 3,790,566. This application Oct. 25, 1973, Ser. No. 409,667

Int. Cl. C07d *93/38, 93/44*

U.S. Cl. 260—239.3 R **2 Claims**

1. A compound of the formula:



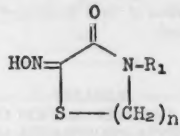
where

R_1 is hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 3–4 carbon atoms, or alkynyl of 3–4 carbon atoms;

R_2 is hydrogen, alkyl of 1–3 carbon atoms, or allyl;

R_3 is hydrogen or methyl; and
n is 3–4.

2. A compound of the formula:



where
R_1 is hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 3–4 carbon atoms, or alkynyl of 3–4 carbon atoms; and
n is 3–4.

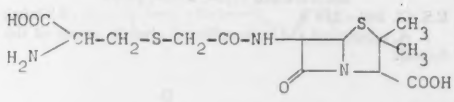
3,883,511

NEW 6-AMINOPENICILLANIC ACID DERIVATIVE

Hugo Troonen, Hoeilaart; Piet Roelants, Watermaal-Bosvoorde, and Bernard Boon, Ohain, all of Belgium, assignors to Recherche et Industrie Therapeutiques (R.I.T.), Genual, Belgium

Filed Mar. 7, 1974, Ser. No. 449,180
Int. Cl. C07d *27/52*
U.S. Cl. 260—239.1 **3 Claims**

1. 6-(D)- [2-amino-2-carboxy)-ethylthio]-acetamido penicillanic acid of the formula:



or a salt thereof with a pharmaceutically acceptable cation.

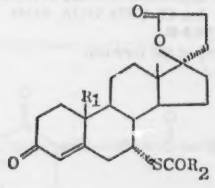
3,883,512

PROCESS FOR THE MANAUFACTURE OF β-(3-OXO-7α-HIOACYL-17β-HYDROXY-4-ANDROSTEN-17α-YL)-PROPIONIC ACID α-LACTONES

Ulrich Stache, Hofheim, Taunus, and Kurt Radscheit, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

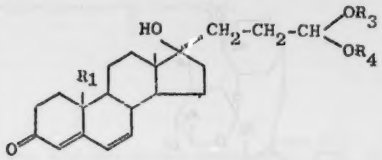
Filed Oct. 18, 1973, Ser. No. 407,479
Claims priority, application Germany, Oct. 20, 1972, 2251476
Int. Cl.² C07C *173/00*
U.S. Cl. 260—239.57 **8 Claims**

1. A process for the manufacture of a β-(3-oxo-7α-thioacyl-17β-hydroxy-4-androsten-17α-yl)-propionic acid γ-lactone of the general formula I



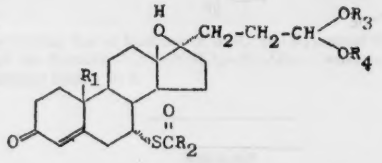
(I)

in which R_1 stands for a methyl group or a hydrogen atom and R_2 for an alkyl group having one to five carbon atoms, which comprises reacting a β-(3-oxo-17β-hydroxy-4,6-androstadien-17α-yl)-propionaldehyde dialkyl or alkylene acetal of the general formula II



(II)

in which R_1 is defined as above and R_3 and R_4 each stands for an alkyl group having one to five carbon atomes, or R_3 and R_4 together stand for an alkylene group having two to five carbon atoms, with a thiocarboxylic acid of from two to six carbon atoms, in a mixture of water and an organic solvent miscible with water, to yield a β-(3′-oxo-7′α-thioacyl-17β′-hydroxy-4′-androsten-17α′-yl)-propionaldehyde dialkyl or alkylene acetal of the general formula III



(III)

in which R_1, R_2, R_3 and R_4 are defined as above, and oxidizing this compound in an acid solution to yield the corresponding γ-lactone of the formula I.

3,883,513

TETRAZOYL DERIVATIVES OF NATURALLY OCCURRING PROSTAGLANDINS

Hans-Jurgen E. Hess, Old Lyme; Leonard J. Czuba, New London, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 177,102, Sept. 1, 1971, abandoned. This application Feb. 26, 1973, Ser. No. 335,586
Int. Cl. C07d *55/00*
U.S. Cl. 260—240 R **29 Claims**

1. 2-descarboxy-2-[tetrazol-5-yl]-ω-pentanorprostaglandins, and their C_{15} epimers, and the corresponding 1- and 3-lower alkyltetrazolyl-ω-pentanorprostaglandins, and their C_{15} epimers, having at the 15-position one hydrogen or alkyl substituent having from 1 to 3 carbon atoms and one alkyl substituent having from 5 to 11 carbon atoms, and the C_9, C_{11}, and C_{15} esters thereof wherein said esterifying group is formyl, alkanoyl having from 2 to 5 carbon atoms, or benzoyl.

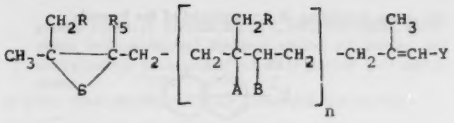
3,883,514

EPITHIO COMPOUNDS

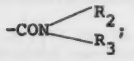
Albert Peiffner, Pfaffhausen, and Ulrich Schwieter, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 858,534, Sept. 16, 1969, Pat. No. 3,697,543. This application Aug. 31, 1970, Ser. No. 68,504
Claims priority, application Switzerland, Sept. 27, 1968, 14,522
Int. Cl. C07d *59/00*
U.S. Cl. 260—240 H **12 Claims**

1, A compound of the formula:



wherein A and B are hydrogen or taken together form a carbon to carbon double bond or a sulfur bridge; R is hydrogen or lower alkyl; R_3 is methyl or hydrogen; Y is a member selected from the group consisting of —C ≡ N;



and

—CH_2OR_4; R_2 and R_3 are hydrogen or lower alkyl, or taken together with their attached nitrogen atoms form a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino and morpholino; R_4 is hydrogen, lower alkyl, lower alkanoyl, benzoyl, lower alkyl substituted benzoyl, amino lower alkyl, lower alkyl substituted amino-lower alkyl, benzyl, phenyl, substituted benzyl, substituted phenyl; and n is an integer from 0 to 1.

3,883,515

ADIABATIC PROCESS FOR THE PRODUCTION OF 2,4-ICHLORO-6-AMINO-S-TRIAZINES

Jai Prakash Tandon, Cranston, and William Sandford Durrell, East Greenwich, both of R.I., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 888,845, Dec. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 787,418, Dec. 27, 1968, abandoned. This application Mar. 14, 1973, Ser. No. 341,019

Int. Cl. C07d *55/18*

U.S. Cl. 260—240 B **19 Claims**

1. A process for the preparation of a 2,4-dichloro-6-monosubstituted amino-s-triazine which comprises reacting, under adiabatic conditions and in a two-phase organic aqueous solvent medium, cyanuric chloride with

a. a primary or secondary amine of the formula R_1R_2NH wherein R_1 is a lower alkyl, alkenyl or cycloalkyl radical containing up to 6 carbon atoms, R_2 is hydrogen, a lower alkylene radical the chain of which can be substituted by the hydroxyl group or by halogen or which can be interrupted by oxygen or sulphur, R_1 and R_2 together with the adjacent nitrogen atom also represent the pyrrolidino, morpholino, pyridazino, or piperidino radical; or

b. an amino compound containing at least one water-solubilizing group selected from among carboxylic and sulfonic acid groups, said amino compound being selected from among amino-substituted stilbene-2,2'-disulfonic acids, benzene sulfonic acids, naphthalenesulfonic acids and anthraquinone sulfonic acids.

3,883,516

PYRROLE-2-CARBOXALDEHYDE DERIVATIVES

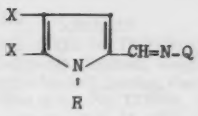
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug, Inc., New York, N.Y.

Filed Apr. 11, 1973, Ser. No. 349,972

Int. Cl. C07d *27/22*

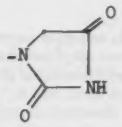
U.S. Cl. 260—240 G **12 Claims**

1. A compound having the formula:



I

wherein X is chlorine, bromine or iodine, both values of X being identical; R is hydrogen or lower-alkyl; and Q is hydroxy, ureido, thioureido or 1-hydantoinyl, having the structure:



3,883,517

8-OXO-5-THIA-1-AZABICYCLO(4,2,0)OCT-2-ENE COMPOUNDS

Karl Heusler, Basel; Hans Bickel, Binningen; Bruno Fechtig, Reinach, Basel-Land; Heinrich Peter, Riehen, and Riccardo Scartazzini, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

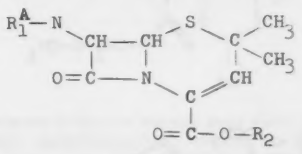
Filed June 2, 1971, Ser. No. 149,341

Claims priority, application Switzerland, June 5, 1970, 8470/70

Int. Cl. C07d *99/24, 99/16*

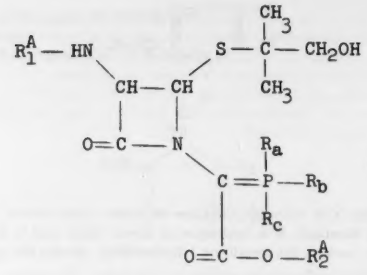
U.S. Cl. 260—243 C **9 Claims**

1. In a process for the manufacture of 7-amino-ceph-3-em-4-carboxylic acid compounds of the formula



(I)

in which R_1^4 is a member selected from the group consisting of phenylacetyl in which phenyl is unsubstituted or substituted by hydroxy, phenylgiycyl, in which phenyl is unsubstituted or substituted by a member selected from the group consisting of hydroxy and hologen in which glycyl portion the amino group is unsubstituted or substituted by sulfo, carbamoyl, guanidinocarbonyl, 2,2,2-trichloroethoxycarbonyl, 2-chloroethoxycarbonyl, 2-bromoethoxy-carbonyl, 2-iodoethoxycarbonyl, tert.-butyloxycarbonyl or phenacyloxycarbonyl; α-carboxyphenylacetyl and α-carboxy-2-thienylacetyl, in which carboxy is a member selected from the group consisting of carboxy and carboxy esterified by lower alkyl; α-sulfo-phenylacetyl, in which sulfo is a member selected from the group consisting of sulfo and sulfo esterified by lower alkyl; and tert.-butyloxycarbonyl, 2,2,2-trichloroethylcarbonyl, 2-iodoethoxycarbonyl and 2-bromoethoxycarbonyl, and R_2 is hydrogen or a group R_2^4, which is a member selected from the group consisting of tert.-butyl, diphenylmethyl, 2,2,2-trichloroethyl, 2-iodoethyl, 2-chloroethyl, 2-bromoethyl, 4-methoxy-benzyl and 4-nitrobenzyl, the step which comprises reacting a compound of the formula



(II)

in which each of R_a, R_b and R_c is a member selected from the group consisting of lower alkyl and phenyl, R_1^A has the meaning given above, whereby functional groups present in R_1^A are in the free or protected form, and R_2^A has the meaning given above, is reacted with dimethylsulfoxide in the presence of an acid anhydride as a reagent with dehydrating or water-absorbing properties.

3,883,518

3-METHYLENE CEPHALOSPORINS

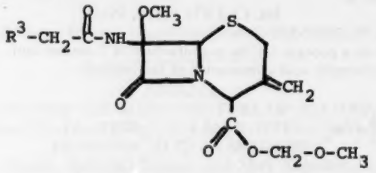
Gerald S. Ponticello, Bridgewater Township, Somerville County; F. Edward Roberts, Princeton, and Leonard M. Weinstock, Belle Mead, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 15, 1972, Ser. No. 253,221

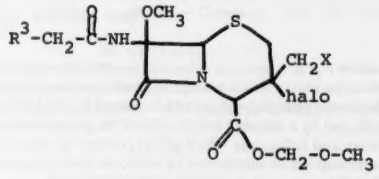
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **3 Claims**

1. A compound of the formula:



or



wherein R^3 is furyl or thienyl; and X is halo or azido.

3,883,519

METHOD FOR PURIFICATION OF CEPHALEXIN

Shoichiro Fujii, Kyoto, and Kunio Takanohashi, Toyonaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

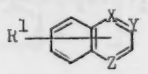
Filed Dec. 1, 1972, Ser. No. 311,430

Claims priority, application Japan, Dec. 4, 1971, 46-97979; Apr. 21, 1972, 47-40676

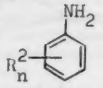
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **21 Claims**

1. A process for producing a sparingly soluble salt of cephalexin, wherein cephalexin is reacted with a base selected from the group consisting of a compound of the formula

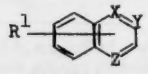


wherein R^1 represents hydrogen, hydroxyl, methyl or ethyl, each of X, Y and Z represents nitrogen or carbon and at least one of X, Y and Z is nigtrogen, with the proviso that all of X, y and Z do not represent nitrogen at the same time, and a compound of the formula

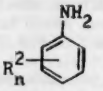


wherein R^2 represents chlorine or alkyl of 1 to 3 carbon atoms and n is an integer of 1 or 2, or R_n^2 represents the group —CH=CH—CH=CH—.

19. A sparingly soluble salt of cephalexin with a base selected from the group consisting of a compound of the formula



wherein R^1 represents hydrogen, hydroxyl, methyl or ethyl, each of X, Y and Z represents nitrogen or carbon and at least one of X, y and Z is nitrogen, with the proviso that all of X, Y and Z do not represent nitrogen at the same time, and a compound of the formula



wherein R^2 represents chlorine or alkyl of 1 to 3 carbon atoms and n is an integer or 1 or 2, or R_n^2 represents the group —CH=CH—CH=CH—.

3,883,520

SUBSTITUTED MERCAPTOACETAMIDOCEPHALOSPORINS

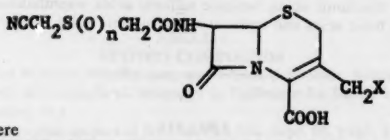
Robert M. DeMarinis, King of Prussia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Filed Aug. 17, 1973, Ser. No. 389,407

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **12 Claims**

1. A compound of the formula



where

n is 0, 1, or 2;

X is SHet; and

Het is a 5 or 6-membered heterocylic ring containing carbon and 1–4 atoms selected from the group consisting of N, O, and S, unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of C_1–C_6, alkoxy of C_1–C_6, allyloxy, oxide, halogen, carbox-

amido, carboxyl, carbalkoxy of C_1–C_6, mercapto, methylthio, trifluoromethyl, hydroxy, amino, alkylamino and dialkylamino, each undefined alkyl having 1–6 carbon atoms

or a non-toxic pharmaceutically acceptable salt thereof.

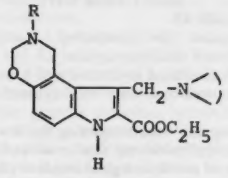
3,883,521

3-SUBSTITUTED-5-AMINOMETHYL-6-CARBETHOXY(OXAZINO [5',6' E INDOLES).

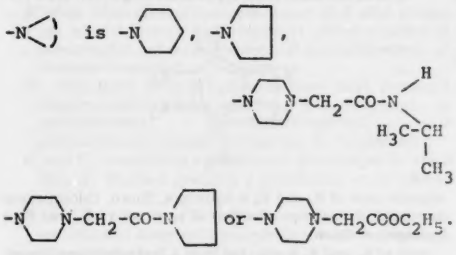
Claude Fauran; Michel J. Turin; Gerard J. Huguet; Guy M. Raynaud, all of Paris, and Bernard M. Pourrias, Meudon La Foret, all of France, assignors to Delalande S.A., Courbevoie, France

Filed May 24, 1973, Ser. No. 363,535
Claims priority, application France, June 8, 1972, 72.20644
Int. Cl. C07d *87/06*
U.S. Cl. 260—244 R **14 Claims**

1. A compound having the formula



wherein R is alkyl having 1 to 6 carbon atoms, allyl, cyclohexyl, diethylamino ethyl or β-hydroxyethyl, and



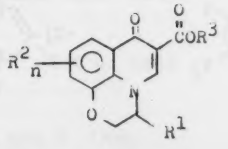
3,883,522

SUBSTITUTED PYRIDO(1,2,3-DE)-1,4-BENZOXAZINES

John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Feb. 11, 1974, Ser. No. 440,951
Int. Cl. C07d *87/00*
U.S. Cl. 260—244 **26 Claims**

1. A compound of the formula



wherein R^3 is hydrogen or lower alkyl, R^1 is hydrogen or lower alkyl, R^2 is lower alkyl, lower alkoxy, halogen or nitro and n is zero to three; when R^2 is nitro, R^1 is methyl or ethyl, or pharmaceutically acceptable salts of such compounds when R^3 is hydrogen.

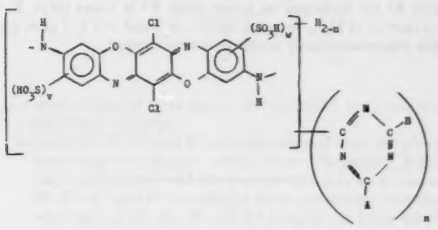
3,883,523

TRIAZINE DERIVATIVES OF TRIPHENODIOXAZINES

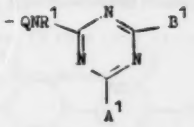
Brian Parton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 137,706, April 26, 1971, abandoned. This application Feb. 21, 1973, Ser. No. 334,287
Claims priority, application United Kingdom, May 15, 1970, 23695/70
Int. Cl. C09b *19/02*
U.S. Cl. 260—246 R **2 Claims**

1. A dyestuff of the formula:



wherein $v + w$ has a value 2.0 to 2.5, $n = 1$ to 2, A is Cl or Br, B is lower alkoxy, sulphophenoxy or NR^1R^2 wherein R^1 is H, CH_3 or CH_2SO_3H and R^2 is H, phenyl, sulphophenyl, disulphophenyl, sulphotolyl, carboxyphenyl, sulphocarboxyphenyl, sulphonaphthyl, disulphonaphthyl, trisulphonaphthyl or



wherein R^1 has the meaning given above, Q is sulphophenylene, disulphophenylene, ethylene, disulphodiphenylene or sulphotolylene, A^1 is Cl, SO_3H, or sulphoanilino or disulphoanilino and B^1 is Cl, lower alkoxy, sulphophenoxy or NR^1R^3 wherein R^1 has the meaning given above and R^3 is H, phenyl, sulphophenyl, disulphophenyl, sulphotolyl, carboxyphenyl, sulphocarboxyphenyl, sulphonaphthyl, disulphonaphthyl or trisulphonaphthyl.

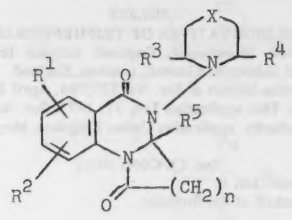
3,883,524

QUINAZOLINE DERIVATIVES

Erhard H. Wolf, Hofheim, Taunus, Germany, and Brian J. Duffy, Flanders, N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed June 8, 1972, Ser. No. 260,799
Int. Cl. C07d *87/42*
U.S. Cl. 260—247.2 A **11 Claims**

1. A compound of the formula



in which R^1 and R^2 are hydrogen, halogen, nitro or amino, R^3 and R^4 are hydrogen or lower alkyl, R^5 is lower alkyl, X is oxygen or $(CH_2)_m$, m being zero, 1 or 2 and n is 2, 3 or 4, and the pharmaceutically acceptable salts thereof.

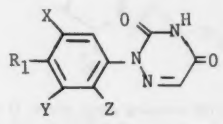
3,883,525

THERMAL REARRANGEMENT OF 3-ARYLOXYTRIAZINE-5(4H)-ONES

Banavara L. Mylari, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed June 13, 1973, Ser. No. 369,587
Int. Cl. C07d *55/10*
U.S. Cl. 260—248 AS **5 Claims**

1. A process for the preparation of a compound of the formula



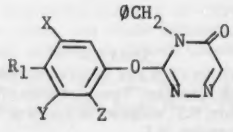
wherein

R_1 is selected from the group consisting of hydrogen, 2-chlorophenoxy and 2-chloro-4-(N-methyl-N-ethylsulfamonyl) phenoxy;

X is selected from the group consisting of hydrogen and methyl;

Y is selected from the group consisting of hydrogen, methyl and chloro; and

Z is selected from the group consisting of hydrogen and chloro, which comprises heating from 200°–350°C. in a reaction-inert solvent a compound of the formula



and thereafter removing the protecting group by catalytic hydrogenolysis at a pressure of from atmospheric to 45 psi at ambient temperature wherein said catalyst is palladium or palladium-on-charcoal.

3,883,526

3-BENZYLPYRIDO [3,4-E]-AS-TRIAZINE AND 1,2-DIHYDRO-3-BENZYLPYRIDO[3,4-E]-AS-TRIAZINE HYDROCHLORIDE

George C. Wright; Allan V. Bayless, and Joseph E. Gray, all of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed June 6, 1973, Ser. No. 367,500
Int. Cl. C07d *57/34*
U.S. Cl. 260—248 AS **3 Claims**

1. The compound 1,2-dihydro-3-benzylpyrido-[3,4-e]-as-triazine hydrochloride.

3,883,527

PROCESS FOR PREPARATION OF 2-ARYL-1,3,4-TRIAZINE-3,5(2H,4H)-DIONES

Thomas M. Brennan, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

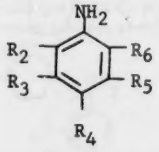
Filed Oct. 19, 1973, Ser. No. 407,872
Int. Cl. C07d *55/10*
U.S. Cl. 260—248 AS **23 Claims**

1. A process for preparing 2-aryl-1,2,4-triazine-3,5(2H,4H)-diones which comprises:

a. coupling a diazotized arylamine with a lower alkyl cyanoacetate to produce a lower alkyl cyanoglyoxalate arylhydrazone;

b. hydrolyzing and decarboxylating the lower alkyl cyanoglyoxalate arylhydrazone thus produced under alkaline conditions to produce a glyoxamide arylhydrazone and

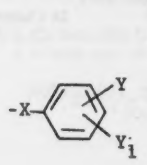
c. reacting the thus produced glyoxamide arylhydrazone with a di(lower alkyl) carbonate in the presence of a basic condensing agent to product a 2-aryl-1,2,4-triazine-3,5(2H,4H)-dione, said arylamine being of the formula



wherein each of R_2 and R_6 is hydrogen, fluoro, chloro, cyano or methyl, with the proviso that at least one of R_2 and R_6 is hydrogen or fluoro;

each of R_3 and R_5 is selected from a first sub-group consisting of hydrogen, cyano, trifluoromethyl, halogen and lower alkyl; a second sub-group consisting of lower alkoxy and lower alkylthio; a third sub-group consisting of nitro and thiocyanato;

R_4 is R_3 or a fourth sub-group consisting of NR_7R_8, alkylsulfonyl having 1 to 9 carbon atoms, SO_2NRR_1, lower alkanoyl, $—CH_2—NR_{11}R_{12}$,



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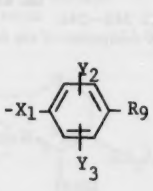

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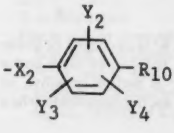
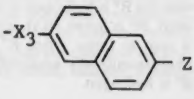
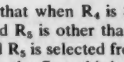


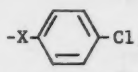
and



with the provisos that when R_4 is SO_2NRR_1 or alkanoyl, at least one of R_3 and R_5 is other than hydrogen; and when at least one of R_3 and R_5 is selected from the second sub-group, R_4 is selected from the first, third or fourth sub-groups; and when R_3 or R_5 is methyl or chloro and X is sulfur, $-SO_2-$ or



then R_4 is other than



R is methyl, ethyl, allyl, propargyl, phenyl, benzyl or p-chlorophenyl;

R_1 is methyl, ethyl, allyl or propargyl;

R and R_1 when taken together with the nitrogen to which they are attached are morpholino, thiomorpholino, pyrrolo, pyrrolino, pyrrolidino, N-(lower alkyl)piperazino, hexamethyleneimino, 3,4-dichloropiperidino, thiazolidino, Δ^3-tetrahydropyridino or piperazino;

Each of R_7 and R_8 is lower alkyl of from 1 to 4 carbon atoms; R_7 and R_8 when taken together with the nitrogen atom to which they are attached are morpholino, thiomorpholino, pyrrolo, pyrrolino, pyrrolidino, piperidino, N-(lower alkyl) piperazino, hexamethyleneimino, thiazolidino, Δ^3-tetrahydropyridino or piperazino;

R_9 is hydrogen, halogen, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, lower alkoxy, trifluoromethyl or nitro;

R_{10} is lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, trifluoromethyl, lower alkanoyl or $SO_2NR'R'_1$;

R′ when taken alone is hydrogen, lower alkyl, allyl, propargyl, phenyl, benzyl, p-chlorophenyl, β-hydroxyethyl, β-acetoxyethyl, β-methoxyethyl, β-methylthioethyl, β-methylsulfonylethyl or cyclopropyl;

R'_1 when taken alone is hydrogen, lower alkyl, propargyl, β-hydroxyethyl, β-acetoxyethyl, β-methoxyethyl, β-methylthioethyl, β-methylsulfonylethyl, γ-(β-methoxyethoxy)-propyl, cyclopropyl or cyclopentyl;

R′ and R'_1 when taken together with the nitrogen to which they are attached complete a morpholino or pyrrolidino ring;

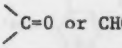
R_{11} and R_{12} taken together with the nitrogen to which they are attached complete a morpholino, thiomorpholino or thiazolidino ring;

X is selected from the group consisting of oxygen, sulfur,

=NH, $-S\rightarrow O$, $-SO_2-$ and $-CHOH-$;

X_1 is $-OCH_2-$, $-SCH_2-$, $-SO_2CH_2-$, $-CH_2-$, $-OCH_2CO-$ or $-NCH_2-$;

X_2 is oxygen, sulfur, $-SO-$, $-SO_2-$,



X_3 is oxygen, sulfur or $-OCH_2-$;

each of Y and Y_1 is selected from the group consisting of hydrogen, nitro, cyano, halogen, lower alkyl and lower alkoxy;

Y_2, Y_3 and Y_4 are each hydrogen, halogen, lower alkyl or trifluoromethyl and

Z is hydrogen, lower alkylthio or halogen.

3,883,528

PREPARATION OF 2(ARYL)-AS-TRIAZINE-3,5(2H,4H)-IONE COCCIDIOSTATS

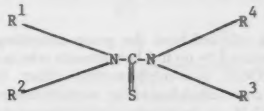
Banavara L. Mylari, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,198

Int. Cl. C07d *55/10*

U.S. Cl. 260—248 AS **7 Claims**

1. A process for the preparation of 2-(aryl)-as-triazine-3,5(2H,4H)dione coccidiostats which comprises contacting the corresponding triazinedione-6-carboxylic acid with at least 0.1 molar proportion of a reagent of the formula



at a temperature of from about 120° to 220°C. until reaction is substantially complete,

wherein R^1, R^2, R^3 and R^4 are each selected from the group consisting of hydrogen, amino, lower alkylamino, lower alkyl, and phenyl, with the proviso that only up to one of R^1, R^2, R^3, and R^4 is amino or lower alkylamino and that when one of R^1, R^2, R^3 and R^4 is amino or lower alkylamino, the remaining substituents are each hydrogen or lower alkyl, and with the further proviso that only up to two of R^1, R^2, R^3 and R^4 may be phenyl and when there are two such phenyl substituents, at least one of the remaining substituents is hydrogen.

3,883,529

NEW CELLULOSE REACTIVE DYESTUFFS

Peter William Austin, Blackley, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

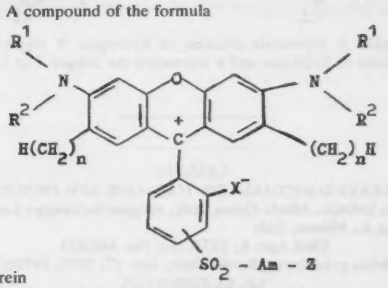
Filed Dec. 4, 1972, Ser. No. 311,522

Claims priority, application United Kingdom, Dec. 15, 1971, 58228/71

Int. Cl. C07d *55/18, 55/20*

U.S. Cl. 260—249.5 **2 Claims**

1. A compound of the formula



wherein

R^1 represents hydrogen or alkyl having 1–4 carbon atoms;

R^2 represents alkyl having 1–4 carbon atoms, phenyl or phenyl having 1–2 substituents selected from the group consisting of NO_2, Cl, Br, and CF_3;

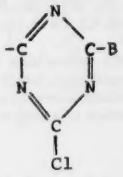
each *n* independently represents 0 or 1;

X^- represents SO_3^- or CO_2^-

Am is NH or a diamine selected from the group consisting of ethylene diamine, N-β-hydroxyethyl ethylene diamine, 1,4-phenylenediamine-2-sulphonic acid, 1,3-phenylenediamine-4-sulphonic acid, 4,4′-diaminodiphenylether-3,3′-disulphonic acid, 4,4′-diaminostilbene-2,2′-disulphonic acid, 4,4′-diaminodiphenyl-2,2′-disulphonic acid, 4,4′-diamino-3,3′-dimethyldiphenyl-2,2′-disulphonic acid and 4,4′-diamino-3,3′-dimethoxydiphenyl-2,2′-disulphonic acid,

the said SO_2 being attached to one of the two nitrogens of said diamine and the said Z being attached to the other of said diamine nitrogens, and

Z has the formula



wherein B is selected from the group consisting of Cl; NH_2; anilino substituted by up to 2 substituents selected from SO_3H, CH_3 and COOH; N-ω-sulphomethyl-anilino; N-methyl sulphoanilino; aminodisulphoanilino; naphthylamino substituted by up to 3 SO_3H groups; sulphatoethylsulphonylanilino; methoxy; phenoxy; sulphophenoxy; and sulphoanilino and disulphoanilino, both of which are further substituted by a member selected from 2-chloro-4-amino-s-triazin-6-ylamino, 2-chloro-4-sulphophenylamino-s-triazin-6-ylamino and dichloro-s-triazinylamino.

3,883,530

CHLORINE SUBSTITUTED METHYLPYRIDAZINES

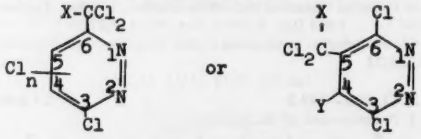
Donald E. Bublitz, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 20, 1972, Ser. No. 299,417

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A **10 Claims**

1. A compound corresponding to one of the formulas



wherein X represents chlorine or hydrogen, Y represents chlorine or hydrogen and *n* represents the integer 1 or 2.

3,883,531

PERHYDROPHTHALAZIN-1(2H)-ONE AND PROCESS

Elvio Bellasio, Albate-Como, Italy, assignor to Gruppo Lepetit S.p.A., Milano, Italy

Filed Apr. 6, 1973, Ser. No. 348,831

Claims priority, application Italy, Apr. 17, 1972, 49700/72

Int. Cl. C07d *51/06*

U.S. Cl. 260—250 P **4 Claims**

1. Perhydrophthalazin-1(2H)-one.

3,883,532

2-SUBSTITUTED -4,5-DIAMINO-6-CYANOPYRIMIDINES

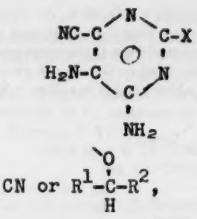
Robert W. Begland, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Mar. 14, 1973, Ser. No. 341,249

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 C **4 Claims**

1. A compound of the formula



X is CN or ,

R^1 and R^2, alike or different, being H or alkyl, alkoxy, alkenyl, alkynyl or alkoxyalkyl of up to 7 carbons, unsubstituted or substituted with up to 14 halogen and/or nitro, or phenyl, unsubstituted or substituted with up to 5 halogen and/or nitro, with the proviso that any α-carbon in R^1 or R^2 carries no more than one fluoro, chloro or nitro substituent.

3,883,533

PROCESS FOR PREPARING 1,4-DIAZABICYCLO OCTANE

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 27, 1973, Ser. No. 428,645

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 T **4 Claims**

1. The process of reacting 1,4-bis(formyl)-piperazine with ethylene glycol at a temperature of from about 200°C. to about 400°C. and a pressure of from about atmospheric to about 200 atmospheres to produce 1,4-diazabicyclo[2.2.2]octane, and recovering the last-named compound.

3,883,534

ANTHRAQUINONE DYES

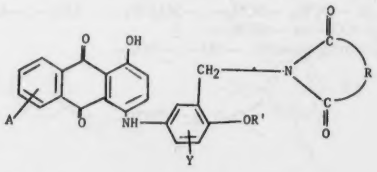
Charles H. Chang, Piscataway, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Dec. 6, 1972, Ser. No. 312,476

Int. Cl. C07d *27/52*

U.S. Cl. 260—281 **7 Claims**

1. A compound of the formula



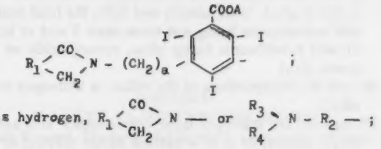
in which A is selected from the group consisting of hydrogen, chlorine, bromine, and lower alkyl; R represents a member selected from the group consisting of alkylene of from 2 to 4 carbon atoms, vinylene, 1,2-benzene, 1,2-cyclohexane, 1,8-naphthalene, and 1,2-cyclohex-4-ene; R′ is lower alkyl; and Y is selected from the group consisting of hydrogen, hydroxy, chlorine, bromine, lower alkyl, and lower alkoxy.

3,883,535
RADIOPAQUE DERIVATIVES OF TRIIODOBENZOIC ACID WITH HETEROCYCLIC SIDE CHAINS

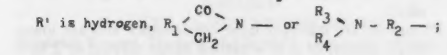
Ernst Felder, and Davide Pitre, both of Milan, Italy, assignors to Bracco Industria Chimica, Societa per Azioni, Milan, Italy

Filed Apr. 7, 1969, Ser. No. 814,193
Claims priority, application Switzerland, May 2, 1968, 6625/68
Int. Cl. C07d *29/28, 29/30*
U.S. Cl. 260—293.64 **19 Claims**

1. A compound of the formula R - R′ wherein R is



R′ is hydrogen,



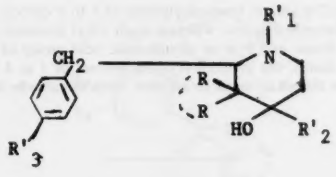
R_1 is alkylene having 2 or 3 carbon atoms;
R_2 is $-(CH_2)_a$;
R_3 is hydrogen or acetyl;
R_4 is hydrogen, methyl, or R—NH—CO—R_5—CO—, R_3 being hydrogen when R_4 is R—NH—CO—R_5—CO—;
R_5 is alkylene or polyoxaalkylene having 4 to 8 carbon atoms;
a is either zero or one; and
A is hydrogen or a non-toxic metal or amine, the compound being water-soluble when A is said metal or amine.

3,883,536
3,3-DISUBSTITUTED-2-BENZYL-4-PIPERIDINOLS

Antony Marie Akkerman, Amsterdam, Netherlands, and Paul Adriaan Jan Janssen, Vosselaar, Belgium, assignors to ACF Chemiefarma N.V., Amsterdam, Netherlands

Division of Ser. No. 41,079, May 27, 1970, Pat. No. 3,764,606. This application Feb. 12, 1973, Ser. No. 331,764
Feb. 12, 1973, Ser. No. 331,764
Int. Cl. C07d *29/18*
U.S. Cl. 260—293.83 **3 Claims**

1. A compound selected from the group consisting of 3,3-di-substituted 2-benzyl-4-piperidinols having the formula



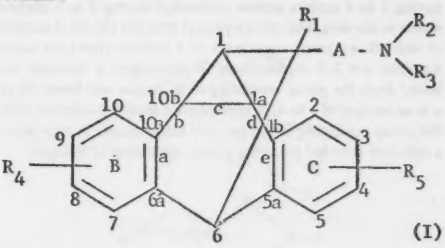
in which both substituents R are selected from the class consisting of methyl, ethyl and groups which, when taken together with the carbon atom to which they are bonded, form cyclopentyl and cyclohecyl, R'_1 is selected from the class consisting of hydrogen atom, methyl and benzyl, R'_2 is selected from the class consisting of alkyl containing up to three carbon atoms, ethinyl, phenyl and pyridyl, and R'_3 is selected from the class consisting of hydrogen atom, hydroxy and methoxy, and salts of said substituted 2-benzyl-4-piperidinols.

3,883,537
NEW 1,1A,6,10 B-TETRAHYDRO-1,6-METHANO-DIBENZO[A,E]CYCLOPROPA[C]CYCLOHEPTENE DERIVATIVES

Herbert Schroter, Fullinsdorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 5, 1973, Ser. No. 376,670
Claims priority, application Switzerland, July 7, 1972, 10215/72
Int. Cl. C07d *29/10*
U.S. Cl. 260—293.62 **20 Claims**

1. A new 1,1a,6,10b-tetrahydro-1,6-methano-dibenzo[a,e]cyclopropa[c]cycloheptene derivative having the formula I



(I)

wherein R_1 represents hydrogen or the hydroxy group, R_2 and R_3 represent hydrogen or alkyl groups having 1 to 3 carbon atoms, R_4 and R_5 represent hydrogen, and A represents the direct bond, an alkylene radical having 1 to 3 carbon atoms, or together with

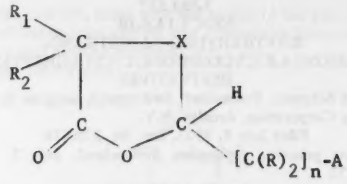
the 1-methyl-4-piperidyl radical, as well as its pharmaceutically acceptable addition salts with inorganic or organic acids.

3,883,538
DIOXOLANES AND OXATHIOLANES

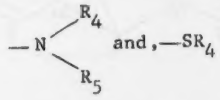
Matthias Pailer; Friedrich Takacs, and Wolfgang Streicher, all of Vienna, Austria, assignors to Rowa Wagner KG, Bensberg, Germany

Continuation of Ser. No. 806,295, March 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 584,111, Oct. 4, 1966, abandoned. This application Jan. 26, 1973, Ser. No. 326,618
Claims priority, application Austria, Oct. 5, 1965, 8981/65; Mar. 15, 1968, 2591/68
Int. Cl. C07d *29/24*
U.S. Cl. 260—293.67 **14 Claims**

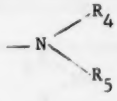
1. A compound selected from the group consisting of bases of the formula:



the non-toxic quaternary ammonium salts and the non-toxic acid addition salts thereof wherein R_1 and R_2 are each a member selected from the group consisting of phenyl, alkyl having 1 to 4 carbon atoms, cycloalkyl having 5 to 6 carbon atoms in the ring, and alkoxy-phenyl wherein the alkyl portion of said alkoxy group contains 1 to 2 carbon atoms, or taken together are 2,2'-diphenylene, R represents a member selected from the group consisting of hydrogen and lower alkyl, *n* is an integer of 1 to 4, X represents a member selected from the group consisting of oxygen and sulfur atoms, A represents a member selected from the group consisting of halogen,



wherein R_4 and R_5 each represents a member of the group of hydrogen and alkyl having up to 8 carbon atoms, and groups in which



represents a member selected from the group consisting of piperidino, morpholino and pyrrolidino.

3,883,539

4-(2-CHLOROETHYLAMINO)-1-METHYLPIPERIDINE DIHYDROCHLORIDE

Thomas J. Schwan, 8 Hillview Dr., Norwich, N.Y. 13815

Filed Jan. 25, 1974, Ser. No. 436,460

Int. Cl. C07d *29/28*

U.S. Cl. 260—293.87 **1 Claim**

1. 4-(2-Chloroethylamino)-1-methylpiperidine dihydrochloride.

3,883,540

UNSYMMETRICAL ESTERS OF N-SUBSTITUTED 1,4-DIHYDROPYRIDINE 3,5-DICARBOXYLIC ACID

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

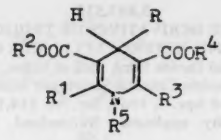
Filed Feb. 28, 1973, Ser. No. 336,605

Claims priority, application Germany, Sept. 12, 1972, 2210672

Int. Cl. C07d *31/36, 31/46*

U.S. Cl. 260—294.9 **25 Claims**

1. A compound of the general formula:



in which

R is mono-, di- or trisubstituted phenyl, in which the substituents are selected from the group consisting of nitro, cyano, azido and $S(O)_n$-lower alkyl, wherein $n = 0$, 1 or 2, lower alkyl, lower alkoxy and halo, the total number of said substituents being not more than 3 and at least one of said substituents being nitro, cyano, azido or $S(O)_n$-lower alkyl,

R^1 and R^3, independent of the other, is hydrogen or lower alkyl;

R^2 and R^4 are different from one another and are lower alkyl, alkenyl of 2 to 4 carbon atoms alkynyl of 2 to 4 carbon atoms, lower alkoxy(lower alkyl) or lower cycloalkyl, unsubstituted or substituted by hydroxy;

R^5 is lower alkyl or benzyl,

or a pharmaceutically acceptable acid addition salt thereof.

3,883,541

4-AMINO-3,5,6-TRICHLORO-2-(FUNCTIONALLY SUBSTITUTED METHYL) PYRIDINE COMPOUNDS

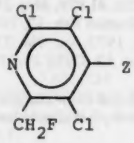
Pamela M. Hamilton, Sunnyvale, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 117,707, Feb. 22, 1971, abandoned. This application Mar. 2, 1973, Ser. No. 337,724

Int. Cl. C07d *31/36*

U.S. Cl. 260—295 R **2 Claims**

1. A 4-amino-3,5,6-trichloro-2-(substituted methyl) pyridine compound having the formula



wherein Z is amino, loweralkylamino of 1 to 4 carbon atoms, or di(loweralkyl)amino wherein each alkyl contains 1 to 4 carbon atoms and F is an oxyalkanoic acid group of 1 to 4 carbon atoms, the loweralkyl esters thereof of 1 to 4 carbon atoms or the alkali metal or alkaline earth metal salts thereof.

3,883,542

PYRIDYL AZIDES AND DERIVATIVES THEREOF

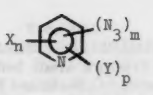
Calvin E. Pannell, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 230,975, March 1, 1972, Pat. No. 3,773,774. This application July 25, 1973, Ser. No. 382,432 July 25, 1973, Ser. No. 382,432

Int. Cl. C07d *31/34*

U.S. Cl. 260—295 R **2 Claims**

1. A compound of the formula



wherein, in said formula, each X is, independently, Cl, Br, I or F; Y is —COOH or —COOR′ (R′ being an alkyl, aryl, alkaryl or aralkyl group of up to 18 carbon atoms in the alkyl portion, wherein said aryl moiety is a carbocyclic aryl of up to 10 carbon atoms); m is 1 to 4; n is 0 to 4; p is 0 to 2; and the sum of $m + n + p$ is from 2 to 5.

3,883,543

N-ALKYL-1,4-DIHYDROPYRIDINES

Friedrich Bossert, Wuppertal-Elberfeld, Germany, assignor to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 201,152, Nov. 22, 1971, Pat. No. 3,773,773, which is a continuation of Ser. No. 35,574, May 7, 1970, abandoned. This application Nov. 2, 1973, Ser. No. 412,477

Claims priority, application Germany, May 10, 1969, 1923990

Int. Cl. C07d *31/36*

U.S. Cl. 260—295.5 B **2 Claims**

1. N-n-butyl-2,6-dimethyl-4-(3′-nitro-6′-chlorophenyl)-1,4-dihydropyridine-3,5-dicarboxylic acid dimethyl ester.

3,883,544

PREPARATION OF TRIAZOLYBENZOPHENONES

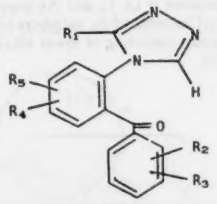
Jackson B. Hester, Jr., Galesburg, and Martin Gall, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 351,141, April 16, 1973, Pat. No. 3,842,089, which is a continuation-in-part of Ser. No. 172,918, Aug. 18, 1971, abandoned. This application June 21, 1974, Ser. No. 481,504

Int. Cl. C07d *55/06, 57/00*

U.S. Cl. 260—296 R **9 Claims**

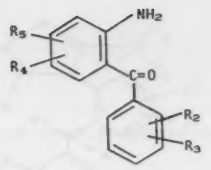
1. A process for the production of 2-(3-substituted-4H-1,2,4-triazol-4-yl)benzophenones of the formula VI:



VI

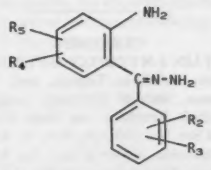
wherein R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, cycloalyl of 3–8 carbon atoms, inclusive, phenyl, and 2-, 3-, and 4-pyridyl and wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, halogen, nitro, alkyl, and alkoxy, in which the carbon chain moieties are of 1 to 3 carbon atoms, inclusive, which comprises the following steps:

1. reacting a 2-aminobenzophenone of formula I



I

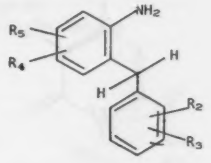
wherein R_2, R_3, R_4, and R_5 are defined as above, with hydrazine hydrate to obtain the corresponding hydrazone II:



II

wherein R_2, R_3, R_4, and R_5 are defined above;

2. treating compound II with a strong base at 100°–150° C. to obtain the corresponding 2-benzylaniline of formula III:



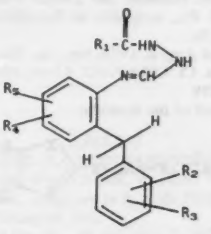
III

wherein R_2 , R_3, R_4, and R_5 are defined as above;

3. heating compound III with triethylorthoformate or trimethylorthoformate, followed by treating with an acid hydrazide of the formula

$NH_2—NH—CO—R_1$

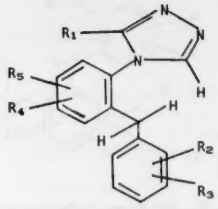
wherein R_1 is defined as above, at room temperature to obtain the corresponding 1-acyl or aroyl-2-[N-(α-phenyl-o-tolyl)formimidoyl]hydrazine (IV) of the formula:



IV

wherein R_1, R_2, R_3, R_4, and R_5 are defined as above;

4. cyclizing IV by heating it in diglyme to obtain the corresponding 4-[α-(phenyl)-o-tolyl]-3-substituted-4H-1,2,4-triazole V:



V

wherein R_1, R_2, R_3, R_4, and R_5 are defined as above;

5. oxidizing V with Jones' reagent to obtain the corresponding 2-(3-substituted-4H-1,2,4-triazol-4-yl)benzophenone VI of above.

3,883,545

CERTAIN 1-HYDROXY-2-PYRIDONES

Gerhard Lohaus, Kelkheim/Taunus, and Walter Dittmar, Hofheim/Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

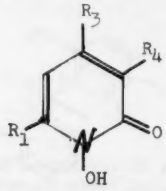
Continuation of Ser. No. 199,320, Nov. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 851,428, Aug. 19, 1969, abandoned. This application Dec. 22, 1972, Ser. No. 317,387

Claims priority, application Germany, Aug. 31, 1968, 1795270

Int. Cl. C07d *31/30*

U.S. Cl. 260—297 Z **9 Claims**

1. A 1-hydroxy-2-pyridone of the formula



wherein R_1 is alkyl of 7 to 11 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, cyclohexylalkyl or phenylalkyl both having 1 to 3 carbon atoms in the alkylene chain and wherein phenylalkyl may be substituted in the phenyl ring by one chlorine or fluorine atom, or α-furyl, and R_3 and R_4 are hydrogen or lower alkyl.

3,883,546

S-HETEROCYCLIC DERIVATIVES OF PHOSPHINE OR PHOSPHITE GOLD MERCAPTIDES

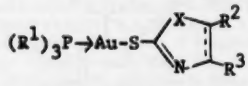
Blaine M. Sutton, Hatboro, and Joseph Weinstock, Phoenixville, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 1, 1973, Ser. No. 384,666

Int. Cl. C07d *91/32, 85/44, 49/36*

U.S. Cl. 260—299 **6 Claims**

1. A compound of the formula:



in which:

R^1 is lower alkyl, lower alkoxy, phenyl or phenoxy, with each alkyl or alkoxy having from one to three carbon atoms;

X is S, NH, NCH_3 or O;

R^2 and R^3 are hydrogen or together form a 1,2-benzo radical; and

indicates an optional double bond.

3,883,547

1,2,3-THIADIAZOLE DERIVATIVES

Heinz Schulz, and Friedrich Arndt, both of Berlin, Germany, assignors to Schering AG, Berlin and Bergkamen, Germany

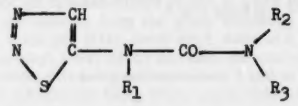
Filed Feb. 26, 1973, Ser. No. 335,661

Claims priority, application Germany, Mar. 23, 1972, 221463

Int. Cl. C07d *91/54*

U.S. Cl. 260—306.8 D **10 Claims**

1. Compounds of the formula:



wherein R_1 is hydrogen, methyl or ethyl; R_2 is hydrogen or alkyl having from 1 to 4 carbon atoms; R_3 is selected from the group consisting of alkyl, having from 1 to 4 carbon atoms, cyclopentyl, cyclohexyl, methylcyclohexyl, phenyl or substituted phenyl having one or more substituents from the group consisting of chlorine, methyl, methoxy, trifluomethyl, and nitro and when taken together with the amino-nitrogen, R_2 and R_3 can be morpholino, piperidino, or pyrrolidino.

3,883,548

3-ARYLTHIOALKYL-4-OPTIONALLY SUBSTITUTED SYDNONES

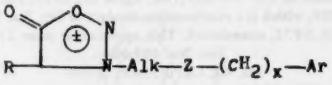
John B. Hill, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 312,708, Dec. 6, 1972, abandoned. This application Apr. 6, 1973, Ser. No. 348,755

Int. Cl. C07d *85/50*

U.S. Cl. 260—307 A **22 Claims**

1. A compound of the formula



wherein R represents hydrogen, lower alkyl, phenyl, or bromo; Alk represents alkylene containing more than 1 and fewer than 5 carbons; Z represents oxygen, thio, sulfinyl, or sulfonyl; *x* represents 0 or 1; and Ar represents naphthyl, phenyl, or phenyl substituted by members selected from less than 3 of the group consisting of lower alkyl, halogen, lower alkoxy, and nitro.

3,883,549

FLUORESCENT ARYL 3,3-PYRAZOLYL-2-PYRAZOLINES

Ian Pearson, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

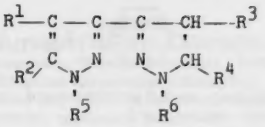
Filed Feb. 5, 1973, Ser. No. 329,328

Claims priority, application United Kingdom, Feb. 10, 1972, 6384/72

Int. Cl. C07d *49/28*

U.S. Cl. 260—310 D **7 Claims**

1. An aryl-3,3′-pyrazolyl-2-pyrazoline of the formula:



wherein R^1 to R^4 independently represent hydrogen or alkyl with up to 4 carbon atoms, and

R^5 and R^6 independently represent phenyl or naphthyl which may be substituted with one substituent from the group of halogen, alkyl with up to 4 carbon atoms, alkoxy with up to 4 carbon atoms, and alkylthio with up to 4 carbon atoms.

3,883,550

HERBICIDES

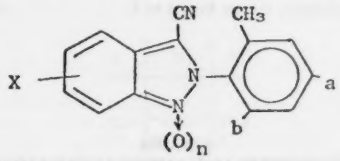
Steven Jerome Goddard, West Grove, Pa., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 20, 1974, Ser. No. 471,808

Int. Cl. C07d *49/02*

U.S. Cl. 260—310 C **4 Claims**

1. A compound of the formula:



wherein

a is chlorine, bromine or methyl;

b is chlorine, bromine, or methyl;

X is hydrogen or fluorine; and

n is 0 or 1

3,883,551

THIENOBENZOPYRANS AND THIOPYRANOBENZOPYRANS

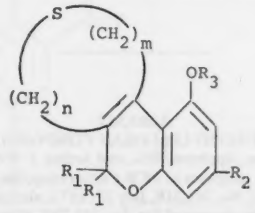
Raj K. Razdan, Belmont, and Harry G. Pars, Lexington, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 852,928, Aug. 25, 1969, abandoned. This application Dec. 20, 1971, Ser. No. 210,170

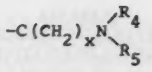
Int. Cl. C07d *65/08;* **A61k** *27/00*

U.S. Cl. 260—327 TH **19 Claims**

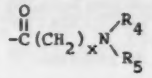
1. A compound of the formula



wherein *m* and *n* are each 0, 1, 2 or 3 and $m + n$ is 2 or 3; R_1 is loweralkyl; R_2 is alkyl or cycloalkylloweralkyl and R_3 is hydrogen, loweralkyl, loweralkanoyl, carbamyl, N-loweralkylcarbamyl, N,N-diloweralkylcarbamyl, phosphonyl, hemisuccinate, phosphate, dialkylaminoalkyl of the structure



or acid addition salt thereof, or dialkylaminoalkanoyl of the structure



or acid addition salt thereof, wherein *x* is 1 through 6 and R_4 and R_5 are loweralkyl; the loweralkyl groups containing from 1 through 6 carbon atoms, the alkyl groups containing from 1 through 20 carbon atoms and the cycloalkyl groups containing from 3 through 8 ring carbon atoms.

3,883,552

(D1)-THIOPHOSPHORIC ACID ESTERS

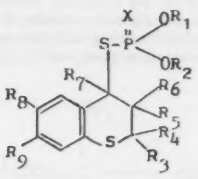
Gerhard Hörlein, Frankfurt, Main, and Gerhard Salbeck, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Main, Germany

Continuation-in-part of Ser. No. 293,133, Sept. 28, 1973, abandoned, and a continuation-in-part of Ser. No. 293,134, Sept. 28, 1973, abandoned. This application July 10, 1973, Ser. No. 377,954

Int. Cl. C07d *65/08*

U.S. Cl. 260—327 TH **9 Claims**

1. A compound of the formula



(I)

wherein

R_1 and R_2 are alkyl having from one to six carbon atoms;

R_3, R_4, R_5, R_6, R_7 are hydrogen or alkyl having from one to four carbon atoms; at least three of the radicals R_3 to R_7 being hydrogen;

R_8, R_9 are hydrogen, halogen, alkyl or alkoxy each having from one to four carbon atoms;

X is oxygen or sulfur.

3,883,553

DICYCLOALKANO [E,G] TETRAHYDROISOINDOLINES

Gilbert H. Berezin, West Chester, Pa., and Walter E. Meier, Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation of Ser. No. 77,312, Oct. 1, 1970, abandoned. This application Dec. 26, 1972, Ser. No. 318,468

Int. Cl. C07d *27/48*

U.S. Cl. 260—326.1 **3 Claims**

1. A compound selected from 2-benzyl-dicycloheptano[e,g]3a,3b,13a,13b-tetrahydroisoindoline and its addition salts with nontoxic acids.

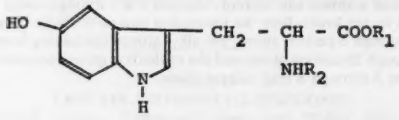
3,883,554

PROCESS FOR PREPARING 5-HYDROXY-TRYPTOPHAN AND ITS DERIVATIVES

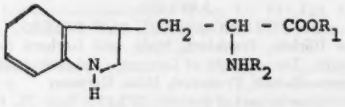
Yasuki Mori, Kawasaki, and Moriyuki Sato, Sapporo, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 190,392, Oct. 18, 1971, abandoned. This application May 8, 1973, Ser. No. 358,518
Claims priority, application Japan, Oct. 26, 1970, 45-93459
Int. Cl. C07d *27/60*
U.S. Cl. 260—326.14 T 4 Claims

1. A process for the preparation of a compound of the formula:



which comprises oxidizing a compound of the formula:



wherein R_1 represents hydrogen, alkyl of 1 to 4 carbon atoms, benzyl or phenethyl; R_2 represents hydrogen, acetyl, propionyl, mono- or di-haloacetyl, benzoyl, mono- or di-substituted benzoyl, said substituent being selected from the group consisting of halogen, nitro, loweralkyl and loweralkoxy, benzyloxycarbonyl, t-butyloxycarbonyl or trityl; with an oxidizing agent selected from the group consisting of hydrogen peroxide, chromic anhydride and potassium nitrosodisulfonate, in a solvent selected from the group consisting of water, inorganic acids, organic acids, alcohols, alkylamines and mixtures thereof, at a temperature of from −10°C. to 60°C.

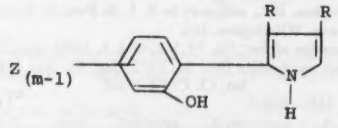
3,883,555

INTERMEDIATES FOR DIPYRRYLMETHENE DYES

Stanley M. Bloom, Waban, and Paulina P. Garcia, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 723,474, April 23, 1968, Pat. No. 3,691,161. This application May 5, 1972, Ser. No. 250,596
Int. Cl. C07d *27/26*
U.S. Cl. 260—326.5 J 4 Claims

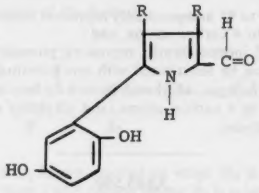
2. A pyrrole of the formula:



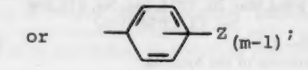
where: one R is hydrogen while the other is a substituent chosen from the group consisting of methyl, ethyl, phenyl

each Z is hydroxy, methyl or methoxy and *m* is a positive integer 1 to 3.

3. A pyrrole of the formula:



where: one R is hydrogen while the other is a substituent chosen from the group consisting of methyl, ethyl, phenyl



each Z is hydroxy, methyl or methoxy and *m* is a positive integer from 1 to 3.

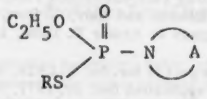
3,883,556

THIOPHOSPHORIC ACID AMIDES AS NEMATOCIDES, INSECTICIDES AND ACARICIDES

Denis Varsanyi, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 9, 1973, Ser. No. 377,465
Claims priority, application Switzerland, July 13, 1972, 10529/72
Int. Cl.[2] C07D *103/00*, *105/00*
U.S. Cl. 260—326.61 3 Claims

1. A compounds of the formula



wherein R represents n-propyl or n-butyl, and A represents ethylene, 1-methylethylene, 1,1-dimethylethylene, 2-butenylene or 2-pentenylene.

3,883,557

TRIMETHYLFLUORAN COMPOUNDS

Sheldon Farber, Appleton, Wis., and Arthur J. Wright, Jamestown, Ohio, assignors to NCR Corporation, Dayton, Ohio

Division of Ser. No. 383,218, July 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 340,799, March 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 243,871, April 13, 1972, abandoned. This application June 26, 1974, Ser. No. 484,021
Int. Cl. C07d *7/42*
U.S. Cl. 260—335 2 Claims

1. The compound 1′,3′,4′-trimethyl-6′-benzylaminofluoran.

3,883,558

4-N-BUTYROXYMETHYL-1,3-DIOXOLANES

Dietmar Lamparsky, Wangen-Dubendorf, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed July 12, 1972, Ser. No. 270,879

Claims priority, application Switzerland, July 23, 1971, 10893/71

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 **4 Claims**

1. A compound selected from the group consisting of 2-(1′-propenyl)-4-n-butyroxymethyl-dioxolane; 2-methyl-2-(1′-hydroxyethyl)-4-n-butyroxymethyl-dioxolane and 2-(2′-methyl-propyl)-4-n-butyroxymethyl-dioxolane.

3,883,559

FLUORINATED DIOXAN DERIVATIVES

James Burdon; Paul Leslie Coe; Ian William Parsons, and John Colin Tatlow, all of Birmingham, England, assignors to Imperial Chemical Industries Limited, London, England

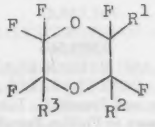
Filed Oct. 10, 1972, Ser. No. 296,136

Claims priority, application United Kingdom, June 9, 1972, 27007/72

Int. Cl. C07d *15/14*

U.S. Cl. 260—340.6 **3 Claims**

1. A hexafluoro- or heptafluoro-1,4-dioxan derivative of the formula:



wherein one or two of R^1, R^2 and R^3 is or are hydrogen, two or one respectively of R^1, R^2 and R^3 being fluorine.

3,883,560

SALICYLAMIDOPHENETHANOLAMINES

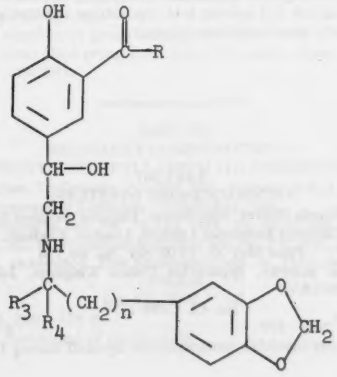
John T. Suh, Mequon, and Thomas M. Bare, Milwaukee, both of Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed July 5, 1973, Ser. No. 376,707

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 **5 Claims**

1. A compound of the formula



in which n is 1 to 3, R is NH_2 and R_3 and R_4 are hydrogen or a lower alkyl of one to four carbon atoms, and pharmaceutically acceptable acid addition salts thereof.

3,883,561

ANTIBIOTIC LACTONES

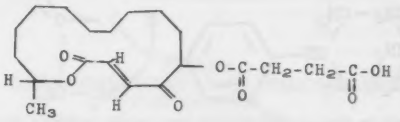
Karl H. Michel, and Marvin M. Hoehn, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 16, 1972, Ser. No. 298,053

Int. Cl. C07d *9/00*

U.S. Cl. 260—343 **3 Claims**

1. Antibiotic A-26771 factors B which has the structural formula



3,883,562

PROCESS FOR THE MANUFACTURE OF PIVALOLACTONE

Hans-Jürgen Arpe, Fischbach, Taunus, Germany, and Lothar Heinz Hönig, deceased, late of Frankfurt am Main, Germany (by Anneliese Hönig, nee Münich, co-heiress), assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

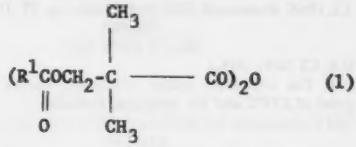
Continuation of Ser. No. 34,640, May 4, 1970, abandoned. This application Jan. 12, 1973, Ser. No. 323,253

Claims priority, application Germany, May 4, 1970, 1923703

Int. Cl. C07d *3/00*

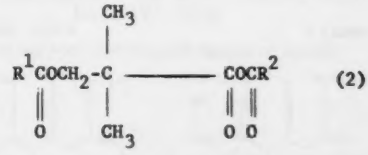
U.S. Cl. 260—343.9 **5 Claims**

1. A process for the manufacture of pivalolactone which comprises the step of thermally decomposing the anhydride of a β-acyloxypivalic acid of the formula (1)



(1)

in which R^1 is hydrogen or an alkyl group with up to 5 carbon atoms, or the mixed anhydride of a β-acyloxypivalic acid and a lower aliphatic carboxylic acid of the formula (2)



(2)

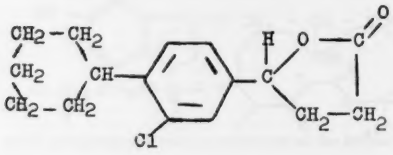
in which R^1 and R^2 have the meaning given above for R^1, at temperatures within the range of from 150°C. to 350°C. in the presence of a molecular sieve formed of a crystalline aluminum silicate of a uniform pore size, the alkali metal ions of which have been exchanged for protons or alkaline earth metal ions, said ion exchange having been carried out in two stages with intermittent heating of the molecular sieve to a temperature of 500°C. to 700°C.

3,883,563
4-(4'-CYCLOHEXYL-3'-CHLOROPHENYL)-γ-BUTYROLACTONE

Francois Krausz, Montpellier, and Marcel Daniel Pierre Brunaud, St. Jean de Vedas, both of France, assignors to C M Industries, Paris, France

Continuation-in-part of Ser. No. 420,277, Dec. 29, 1973, which is a continuation of Ser. No. 35,919, May 8, 1970, abandoned. This application July 19, 1974, Ser. No. 489,983
Claims priority, application France, Aug. 6, 1973, 73.28636
Int. Cl. C07d 5/06
U.S. Cl. 260—343.6 1 Claim

1. A compound of the formula



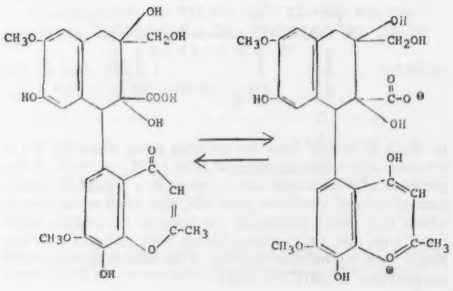
(I)

3,883,564
PRODUCTS FROM PLICATIC ACID AND PROCESS

Donald W. Langille, deceased, late of Vancouver, British Columbia, Canada (by Olive I. Langille, petitioner), assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 712,337, March 8, 1968, Pat. No. 3,773,792, which is a continuation of Ser. No. 425,066, Jan. 12, 1965, abandoned. This application Aug. 27, 1973, Ser. No. 392,053
Int. Cl. C07d 7/32
U.S. Cl. 260—345.2 3 Claims

1. The crystalline yellow compound having the melting point of 239°C and the structural formula

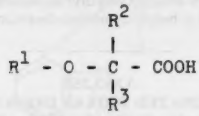


3,883,565
ESTER OF α-TOCOPHEROL

Thomas Patrick Cunningham Mulholland, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 24, 1973, Ser. No. 409,315
Claims priority, application United Kingdom, Oct. 24, 1972, 48929/72
Int. Cl. C07d 7/22
U.S. Cl. 260—345.5 2 Claims

1. An ester of α-tocopherol with an acid of the formula:



wherein R^2 and R^3 are both methyl and R^1 is p-chlorophenyl, 4-(p-chlorophenyl)benzyl, 4-(p-chlorophenyl)phenyl or 4-(1,2,3,4-tetrahydronaphth-1-yl)phenyl; or R^2 is hydrogen, R^3 is p-chlorophenoxy and R^1 is p-chlorophenyl; or R^2 is hydrogen, R^3 is p-chlorophenyl and R^1 is m-trifluoromethylphenyl.

3,883,566
PURIFICATION AND HYDROGENATION OF FURAN CONCENTRATES

Marvin M. Johnson, and Donald C. Tabler, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 175,432, Aug. 27, 1971, abandoned. This application Sept. 6, 1972, Ser. No. 286,728
Int. Cl. C07d 5/02
U.S. Cl. 260—346.1 R 9 Claims

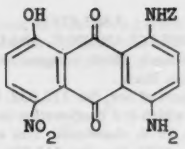
1. A process for extending the life of hydrogenation catalysts and improving the hydrogenatability of furan concentrates to produce high purity tetrahydrofuran products which comprises contacting a furan concentrate containing deleterious unsaturated hydrocarbon contaminants and sulfur compounds, but which is substantially free of high boiling materials, prior to hydrogenation, with zinc oxide at a temperature ranging from about 550 to about 850°F for a finite period of time sufficient to render innocuous compounds present in said concentrate which tend to inactivate hydrogenation catalysts, and hydrogenating said concentrate substantially free of catalyst inactivating materials by contacting with a hydrogenation catalyst and hydrogen under hydrogenation conditions sufficient to hydrogenate said unsaturated hydrocarbons to paraffinic materials and convert said concentrate substantially to a high purity tetrahydrofuran product.

3,883,567
ANTHRAQUINONE DYESTUFFS

Edwin Dennis Harvey, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 25, 1970, Ser. No. 40,374
Claims priority, application United Kingdom, June 17, 1969, 30618/69
Int. Cl. C09b 1/50
U.S. Cl. 260—379 6 Claims

1. Water-insoluble anthraquinone dyestuff having the formula



wherein Z is selected from the group consisting of lower alkoxy lower alkyl, cyclohexyl, benzylcyclohexyl, phenyl lower alkyl, phenyl, lower alkylphenyl, lower alkoxy phenyl, chlorophenyl, bromophenyl, hydroxy lower alkoxy phenyl and hydroxy lower alkylphenyl.

3,883,568

2-(2'ETHYLHEXYL)-QUINIZARIN

Robert J. Turner, Lake Geneva, Wis.; David L. Booth, and Richard D. Berry, both of Crystal Lake, Ill., assignors to Morton-Norwich Products, Inc., Chicago, Ill.

Division of Ser. No. 152,922, June 14, 1971, Pat. No. 3,764,273. This application May 14, 1973, Ser. No. 359,963

Int. Cl. C07c *49/74*

U.S. Cl. 260—383 **1 Claim**

1. The compound 2(2-ethylhexyl) quinizarin.

3,883,569

NOVEL 3α-HYDROXYSTEROIDS OF THE 5α-PREGNANE SERIES

Gordon Hanley Phillipps, Wembley; Christopher Earle Newall, Acton, and Martin Christopher Cook, Chalfont St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Filed Dec. 16, 1971, Ser. No. 208,985

Claims priority, application United Kingdom, Dec. 17, 1970, 60066/70

Int. Cl. C07c *169/32*

U.S. Cl. 260—397.45 **12 Claims**

1. A steroid of the 5α-pregnane series possessing a 3α-hydroxy group, a 10-hydrogen or methyl group, and 11-oxo group, a 17α-hydrogen atom, a 20-oxo group and a group of the formula -XR at the 21-position, wherein X represents a group of the formula —OCO— or —OCOO— and R represents:

a. an alkyl group of 1–5 carbon atoms or a benzyl group, each of said alkyl or benzyl groups being substituted by a group of the formula $-NR^1R^2$ wherein R^1 and R^2 are the same or different and each represents a hydrogen atom or an alkyl group having 1–4 carbon atoms or wherein R^1 and R^2 together with the nitrogen atom represent a piperazino or morpholino group or such a group substituted by at least one alkyl group containing 1–6 carbon atoms; or a pyridyl group;

b. a nitrobenzyl group when X is —OCO—; or

c. a lower alkyl group containing 1–5 carbon atoms when X is —OCOO—.

3,883,570

BIS(DIALKYLAMINOMETHYL)-PHENYLENEDIPALLADIUM (II) COMPOUNDS

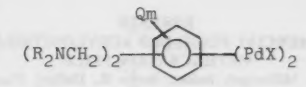
Swiatoslaw Trofimenko, Newark, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 75,233, Sept. 24, 1970, Pat. No. 3,770,785, Continuation-in-part of Ser. No. 792,841, Jan. 21, 1969, abandoned. This application Sept. 6, 1973, Ser. No. 394,824

Int. Cl. C07f *15/00*

U.S. Cl. 260—429 R **6 Claims**

1. A compound of the formula



wherein

the R's, alike or different, are lower alkyl;

Q is primary or secondary lower alkyl, lower alkoxy, halo, nitro, cyano or lower alkoxycarbonyl;

m is 0, 1 or 2; and

X is Cl or Br, with the proviso that each palladium atom is ortho to an R_2NCH_2 group.

3,883,571

LIQUID DIPHENYLMETHANE DIISOCYANATE COMPOSITIONS

Dennis Charlton Allport, and Graham Briggs, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 10, 1973, Ser. No. 395,599

Claims priority, application United Kingdom, Sept. 26, 1972, 44404/72

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 AM **3 Claims**

1. A diphenylmethane diisocyanate composition which consists essentially of a 4,4'-diphenylmethane diisocyanate containing not more than 10 percent of isomers thereof, and in which from 15 to 30 percent of the isocyanate groups have been reacted at a temperature of 40° to 120°C with a mixture of three alkylene glycols, said alkylene glycols being selected from the group consisting of diethylene glycol, triethylene glycol, tetraethylene glycol, 1,2-propylene glycol, 1,3-propylene glycol, neopentyl glycol, 1,3-butane diol and 1,2-butane diol each of said glycols being present in said mixture in such proportions that no one glycol constitutes more than 50 or less than 25 molar per cent of said total glycols.

3,883,572

NOVEL MERCAPTODERIVATIVES OF IONONES AND IRONES

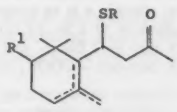
Daniel Helmlinger, Dubendorf; Dietmar Lamparsky, Wangen-Dubendorf; Peter Schudel, Grut; Trudi Sigg-Grütter, Winterthur, and Jost Wild, Zurich, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 203,112, Nov. 26, 1971, Pat. No. 3,845,134. This application Mar. 29, 1974, Ser. No. 456,341

Int. Cl. C07c *153/01*

U.S. Cl. 260—455 R **2 Claims**

1. Ionone and irone derivatives of the general formula



(I)

wherein R represents the acetyl group and R^1 represents a hydrogen atom or the methyl group and wherein the broken lines denote a double bond which is present in one of the three indicated positions.

3,883,573
COMMERCIAL FIXED-BED ACRYLONITRILE OR METHACRYLONITRILE

Ernest C. Milberger, Solon; Serge R. Dolhyj, Parma, and James F. White, Akron, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed June 15, 1973, Ser. No. 370,287
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.3 **4 Claims**

1. In the process for preparing acrylonitrile or methacrylonitrile by the reaction of a mixture of propylene or isobutylene, ammonia and molecular oxygen in the presence of an ammoxidation catalyst in a fixed-bed reactor containing one or more tubes, the improvement comprising

using two catalysts in each of one or more of the tubes of the fixed-bed reactor—the first catalyst being a catalyst consisting of an essentially inert support material with an outer surface and coating of a catalytic material strongly adhering to the outer surface of the support, and the second catalyst being a catalyst consisting essentially of the catalytic material and

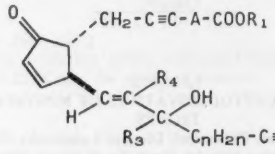
arranging the catalysts in the tube of the fixed-bed reactor in such a manner that the first catalyst contacts the reactants first and the second catalyst contacts the reactants subsequent to contact with the first catalyst.

3,883,574
PROSTAGLANDIN A_3 ANALOGS

Udo F. Axen, Comstock, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 112,032, Feb. 2, 1971, Pat. No. 3,775,462, which is a continuation-in-part of Ser. No. 30,312, April 20, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,906
Int. Cl. C07c *61/36, 69/74*
U.S. Cl. 260—468 D **23 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein R_1 is hydrogen, alkyl of 1 to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one to 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive, or β,β,β-trichloroethyl; wherein R_2 is alkyl of one to 4 carbon atoms, inclusive, substituted with zero to 3 fluoro; wherein R_3 and R_4 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive; wherein n is an integer of 1 to 4, inclusive; wherein A is alkylene of 1 to 10 carbon atoms, inclusive, substituted with zero to 2 fluoro, and with one to 5 carbon atoms, inclusive, between $—COOR_1$ and

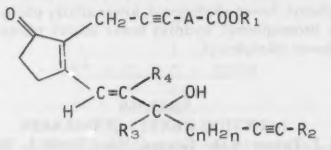
or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

3,883,575
PROSTAGLANDIN B_3 ANALOGS

Udo F. Axen, Comstock, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 112,032, Feb. 2, 1971, Pat. No. 3,775,462, which is a continuation-in-part of Ser. No. 30,312, April 20, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,986
Int. Cl. C07c *61/36, 69/74*
U.S. Cl. 260—468 D **23 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein R_1 is hydrogen, alkyl of 1 to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with 1 to 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive, or β,β,β-trichloroethyl; wherein R_2 is alkyl of 1 to 4 carbon atoms, inclusive, substituted with 0 to 3 fluoro; wherein R_3 and R_4 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive; wherein n is an integer of 1 to 4, inclusive; wherein A is alkylene of 1 to 10 carbon atoms, inclusive, substituted with zero to 2 fluoro, and with 1 to 5 carbon atoms, inclusive, between $—COOR_1$ and

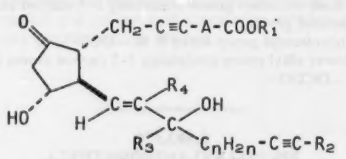
or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

3,883,576
PROSTAGLANDIN E_3 ANALOGS

Udo F. Axen, Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 112,032, Feb. 2, 1971, Pat. No. 3,775,462, which is a continuation-in-part of Ser. No. 30,312, April 20, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,973
Int. Cl. C07c *61/36, 69/74*
U.S. Cl. 260—468 D **23 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein R_1 is hydrogen, alkyl of 1 to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one to 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive, or β,β,β-trichloroethyl; wherein R_2 is alkyl of one to 4 carbon atoms, inclusive, substituted with zero to 3 fluoro; wherein R_3 and R_4 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive; wherein n is an integer of 1 to 4, inclusive;

wherein A is alkylene of one to 10 carbon atoms, inclusive, substituted with zero to 2 fluoro, and with one to 5 carbon atoms, inclusive, between $—COOR_1$ and

or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

3,883,577

PROCESS FOR PREPARING HIGH MOLECULAR WEIGHT POLYISOCYANATES

Antonio Rabizzoni, Busto, and Aldo Trovati, Novara, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Sept. 21, 1973, Ser. No. 399,722
Claims priority, application Italy, Sept. 22, 1972, 29524/72
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **7 Claims**

1. Process for preparing high molecular weight polyisocyanates by reaction of addition between an alkyl or alkylaryldiisocyanate and an active hydrogen-containing compound selected from aliphatic diols, triols and polyhydric alcohols, characterized in that

a. The alkyl or alkylaryldiisocyanate is reacted at a temperature comprised between 20° and 100°C with the active hydrogen-containing compound in a solvent having a strong affinity for the reaction product, said solvent being only partly miscible with aliphatic and/or cycloaliphatic hydrocarbons and having a low boiling point, the molar ratio isocyanic equivalents —NCO/hydroxy equivalents —OH being comprised between 2 and 3;

b. The alkyl or aryldiisocyanates are extracted at a temperature from 20°to 50°C from the solution obtained in (a) either batchwise or continuously with an extracting mixture comprising aliphatic and/or cycloaliphatic hydrocarbons, preferably in admixture with the same reaction solvent medium.

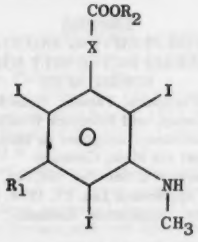
3,883,578

RADIOPAQUE AGENTS

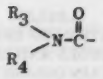
Heinz Gries, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Sept. 29, 1971, Ser. No. 184,941
Claims priority, application Germany, Oct. 2, 1970, 2050217
Int. Cl. C07c *101/54*
U.S. Cl. 260—471 R **27 Claims**

1. Compounds of the formula



wherein R_1 is H, I, $—NHCH_3$, mono-lower-alkanoyl-amino, N-lower alkyl-lower-alkanoyl-amino, di-lower-alkanoyl-amino, lower-alkanoyl-aminomethyl or carbamoyl of the formula



wherein R_3 and R_4 are each hydrogen, lower alkyl or hydroxy-lower-alkyl; R_2 is H or lower alkyl; and X is a C—C single bond or lower alkylene; and physiologically acceptable salts thereof.

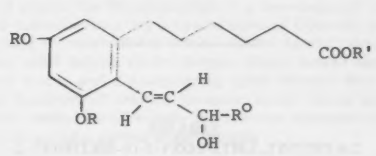
3,883,579

1-(2′,4′-DISUBSTITUTED-6′-ω-SUBSTITUTED-HEXYL-1′-HENYL)-1-OLEFIN-3-OLS

Eugene E. Galantay, Morristown, N.J., assignor to Sandoz-Wander, Inc., E. Hanover, N.J.

Division of Ser. No. 201,109, Nov. 22, 1971, Pat. No. 3,804,883, which is a continuation-in-part of Ser. No. 86,270, Nov. 2, 1970, abandoned. This application Dec. 14, 1973, Ser. No. 424,817
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 R **9 Claims**

1. A compound of the formula:



wherein

R° is straight chain alkyl of 4 to 6 carbon atoms,

R′ is hydrogen, a pharmaceutically acceptable salt-forming cation or alkyl of 1 to 4 carbon atoms, and

both Rs which are the same, are hydrogen, alkyl of 1 to 3 carbon atoms or —COR″ wherein R″ is alkyl of 1 to 4 carbon atoms.

3,883,580

ASYMMETRIC REDUCTION OF KETONES TO FORM OPTICALLY ACTIVE ALCOHOLS

Arthur John Solodar, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 9, 1972, Ser. No. 224,971
Int. Cl. C07c *125/04, 29/16*
U.S. Cl. 260—482 C **19 Claims**

1. A process for preparing an optically active secondary alcohol comprising reacting an optically inactive ketone having no asymmetric atoms of the formula

where R is different from R′ and where both R's can be any substituted or unsubstituted monovalent hydrocarbon group attached directly to the carbonyl group through a carbon atom,

with hydrogen in the presence of an optically active catalyst which is a coordination complex comprising

a. a Group VIII metal having an atomic number greater than 43, in combination with

b. at least one optically active phosphine or arsine ligand wherein the optical activity results from having three different groups bonded to the phosphine or arsine atom.

3,883,581
PREPARATION OF BROMINATED PENTAERYTHRITOLS AND ESTERS UTILIZING CERTAIN DIBASIC ACIDS

Ralph A. Davis, Midland; Ronald G. Tigner, Coleman; R. Garth Pews, Midland; Jurgen H. Exner, Midland, and Carl L. Gibbons, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 23, 1973, Ser. No. 363,203
Int. Cl. C07c *69/44, 69/60*
U.S. Cl. 260—485 G 9 Claims

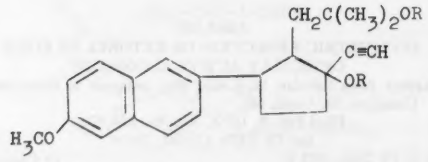
1. A process for preparing mixtures of brominated pentaerythritols and brominated neopentyl esters, comprising contacting pentaerythritol with HBr and from about 0.2 mole percent to about 50 mole percent, based on pentaerythritol charged, of an acid selected from the group consisting of aliphatic saturated dicarboxylic acids or their anhydrides, free of any substitutents except halogen, having from 3 to 10 carbon atoms in their molecule and aliphatic monoethylenically unsaturated dicarboxylic acids selected from the group consisting of maleic, fumaric, itaconic, citraconic, their anhydrides and halogenated derivatives, at a temperature of from about 85° to about 140°C., in the liquid phase and in an inert solvent, the product mix being determined by the amounts of HBr and dicarboxylic acid used.

3,883,582
2-ETHYNYL-2-HYDROXY-5-(6-METHOXY-2-NAPHTHYL)-ALPHA, ALPHA-DIMETHYLCYCLOPENTANEETHANOL AND ESTERS

Leland J. Chinn, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 30, 1973, Ser. No. 355,777
Int. Cl. C07c *69/14, 69/24*
U.S. Cl. 260—488 CD 3 Claims

1. A compound of the formula



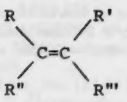
wherein R represents lower alkanoyl.

3,883,583
OIL SOLUBLE ANIONIC SURFACE ACTIVE AGENT

Masuzo Nagayama, and Hiroshi Okada, both of Tokyo, Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 51,323, June 30, 1970, abandoned. This application Dec. 8, 1972, Ser. No. 313,427
Int. Cl. C07c *143/02*
U.S. Cl. 260—513 R 2 Claims

1. A low viscosity, oil-soluble surface active agent prepared by sulfonating monoolefin of the formula



wherein R is alkyl, R', R'' and R''' each is hydrogen or alkyl, with the proviso that not all of R', R'' and R''' are hydrogen and with the further proviso that the total number of carbon atoms of R, R', R'' and R''' is 30 to 38, by contacting a thin film of said olefin with a gas having a temperature of 30° to 100°C and containing 1 to 10 vol. percent of SO_3 and the balance is inert gas, at a molar ratio of SO_3/olefin in the range of 0.5 to 1.5/1.0, at a reaction temperature from 5° to 100°C above the solidifying point of said olefin, to form a sulfonated reaction product, containing alkenesulfonic acids and sultones,

and neutralizing said reaction product by adding to said reaction product from 0.6 to 1.0 equivalents, based on the SO_3 reacted, of an alkali metal, ammonium or alkaline earth metal hydroxide or carbonate, the amount added being sufficient to render the reaction mixture alkaline and then maintaining said reaction mixture at a temperature of 100° to 200°C for a period of 1 minute to 7 hours to hydrolyze the sultones.

3,883,584
PROCESS FOR THE PREPARATION OF TEREPHTHALIC ACID

Yataro Ichikawa, Iwakuni, Japan, assignor to Teijin Ltd., Osaka, Japan

Filed Nov. 17, 1972, Ser. No. 307,394
Claims priority, application Japan, Nov. 25, 1971, 46-94664; Oct. 11, 1972, 47-101099
Int. Cl. C07c *63/02, 63/26*
U.S. Cl. 260—524 A 13 Claims

1. In the process for the preparation of terephthalic acid by oxidizing paraxylene and/or paratoluic acid with a molecular oxygen-containing gas in the liquid phase, the improvement which consists essentially of carrying out said oxidation reaction

1. in the substantial absence of a lower fatty acid or halogen compound;
2. in the presence of a catalyst consisting essentially of cobalt or an organic cobalt compound and manganese or an organic manganese compound, which are at least partially soluble in the reaction mixture, the sum total of cobalt and manganese calculated as metals, present in the total oxidation reaction mixture being in the amount of 0.005 to 0.5 percent by weight, the weight ratio, calculated as metals, of the cobalt and manganese being 99.8:0.2 to 20:80; and
3. at a temperature in the range of 150° to 220°C.

3,883,585
PROCESS FOR PURIFYING AND STABILIZING AQUEOUS ALKALI METAL SALT SOLUTIONS OF SORBIC ACID

Hans Fernholz, Fischbach, Taunus; Hans-Joachim Schmidt, Falkenstein, Taunus, and Friedrich Wunder, Florsheim am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 380,745, July 19, 1973, abandoned. This application Jan. 17, 1974, Ser. No. 434,042
Claims priority, application Germany, Mar. 3, 1973, 2310758
Int. Cl. C07c *57/10*
U.S. Cl. 260—526 N 7 Claims

1. A process for purifying and stabilizing an aqueous alkali metal salt solution of sorbic acid which comprises treating the solution with surface-active carbon derived from mineral coal.

3,883,586

PROCESS FOR PREPARING ESTERS OF OMEGA-AMINODODECANOIC ACID

Iwao Yokoyama; Hiroo Sasaki; Tetsuo Tanaka, and Keiichi Kihara, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Feb. 15, 1974, Ser. No. 442,883
Claims priority, application Japan, Mar. 19, 1973, 48-3086
Int. Cl. C07c *101/18*
U.S. Cl. 260—404 **10 Claims**

1. A process for preparing an ω-aminododecanoic acid ester having the formula

$$H_2N-(CH_2)_{11}COOR_3$$

wherein R_3 represents a saturated C_{1-4} alkyl group; which comprises the step of: reacting an ω-nitrocarboxylic acid ester having the formula

$$O_2N-(CH_2)_3-R_1-(CH_2)_2-R_2-(CH_2)_2-COOR_3$$

wherein R_1 and R_2 are both $-CH_2-CH_2-$ or $-CH=CH-$, or R_1 is $-CH_2CH_2-$ when R_2 is $-CH=CH-$ or R_1 is $-CH=CH-$ when R_2 is $-CH_2CH_2-$ and R_3 represents a saturated C_{1-4} alkyl group, with hydrogen in a hydrocarbon solvent in the presence of a palladium, platinum or nickel hydrogenation catalyst.

3,883,587

PROCESS FOR MANUFACTURING POLYOL ESTERS OF CARBOXYLIC ACID

Hiroshi Isa, Funabashi; Takeo Inagaki, Yachiyo; Yasuhiro Kiyonaga, Narashino, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1973, Ser. No. 422,578
Claims priority, application Japan, Dec. 11, 1972, 47-124646
Int. Cl. 260 *497*; **C07c** *67/00*
U.S. Cl. 260—410.6 **8 Claims**

1. In a process for preparing polyol esters of carboxylic acids, comprising reacting an olefin having from 4 to 30 carbon atoms and a polyhydric alcohol, wherein the molar ratio of said olefin to the reactive hydroxyl groups of said polyhydric alcohol is about 1/1 or more, with an excess of carbon monoxide at a pressure in the range of from 60 to 300 kg/cm², the reaction being carried out at a temperature of from 90° to 250° C., in the presence of a first catalyst of cobalt, nickel or rhodium, and a second catalyst of pyridine or a derivative of pyridine, and removing carbon monoxide to produce an intermediate reaction product containing the unreacted polyhydric alcohol, the improvement which comprises the step of:

reheating said intermediate reaction product containing the unreacted polyhydric alcohol to a temperature of from 60° to 300°C. without distilling off the unreacted polyhydric alcohol for a period of time effective to complete the conversion of hydroxyl groups in said polyhydric alcohols to ester groups whereby to obtain polyol ester of carboxylic acid at a high purity and a high yield.

3,883,588

METHOD OF PREPARING ACRYLIC ACID

Francis W. Schlaefer, Pennsauken, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 124,889, March 16, 1971, abandoned. This application Nov. 9, 1973, Ser. No. 414,470
Int. Cl. C07c *51/32*, *57/04*
U.S. Cl. 260—533 N **5 Claims**

1. In a process of oxidizing α,β-unsaturated aliphatic hydrocarbons selected from the group consisting of propylene, butene-1, isobutylene, pentene-1, hexene-1, and octene-1, by means of oxygen contact with said hydrocarbon and with a fixed bed catalyst comprising oxides of cobalt and molybdenum, the improvement, prior to the introduction of hydrocarbon and during bringing the reactor up to reaction temperature, and after terminating the flow of hydrocarbon and during cooling of the reactor, of continuously passing an oxygen-containing gas through the reactor in an amount which results in an oxygen level at the reactor outlet such that after scrubbing with water the gas stream contains at least 1.5 percent oxygen.

4. In a process of oxidizing α,β-unsaturated aliphatic hydrocarbons selected from the group consisting of propylene, butene-1, isobutylene, pentene-1, hexene-1, and octene-1, by means of oxygen contact with said hydrocarbon and with fixed bed catalyst comprising oxides of cobalt and molybdenum, the improvement of controlling the dependent variables of the amounts of the various feed stream components and the reactor effluent composition by maintaining the steam level at at least 15 percent of the feed stream, the hydrocarbon at a level of less than 20 percent of the feed stream, and the oxygen level in the feed stream at a level such that the gaseous reactor effluent, after water washing, contains at least 1.5 percent oxygen.

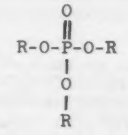
3,883,589

PREPARATION OF MONOHALOACYL HALIDES

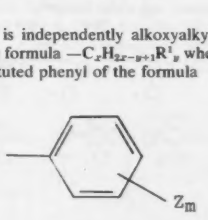
Virgil W. Gash, and Donald E. Bissing, both of Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed July 16, 1973, Ser. No. 379,899
Int. Cl. C07c *51/58*, *50/20*
U.S. Cl. 260—544 Y **19 Claims**

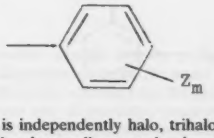
1. A process for the preparation of a monohaloacyl halide which comprises reacting a ketene selected from the group consisting of unsubstituted ketene, methyl ketene, dimethyl ketene, ethyl ketene, diethyl ketene, phenyl ketene and diphenyl ketene and a halogenating agent selected from the group consisting of chlorine, bromine, iodine, iodine monochloride, iodine monobromide and bromine monochloride in the presence of a solvent of the formula



wherein each R is independently alkoxyalkyl, alkyl, substituted alkyl of the formula $-C_xH_{2x-y+1}R^1_y$ wherein R^1 is halo, phenyl, or substituted phenyl of the formula



wherein each Z is independently halo, trihalomethyl, cyano, nitro, lower alkyl or lower alkoxy, and *m* is an integer from 1 through 3, inclusive, provided that when each Z is nitro, *m* cannot exceed 2, *x* is an integer from 1 through 8, inclusive, and *y* is an integer from 1 through 3, inclusive, phenyl or substituted phenyl of the formula



wherein each Z is independently halo, trihalomethyl, cyano, nitro, lower alkyl or lower alkoxy, and *m* is an integer from 1 through 3, inclusive, provided that when each Z is nitro, *m* cannot exceed 2 or two R's when taken together are alkylene of the empirical formula C_nH_{2n} wherein *n* is an integer from

2 through 8, inclusive, and having from two through four carbons, inclusive, in a continuous chain.

3,883,590

PREPARATION OF N-ALKYLARYLCARBOXAMIDES

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 148,916, June 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 853,963, Aug. 28, 1969, Pat. No. 3,634,510. This application Apr. 2, 1973, Ser. No. 347,588

Int. Cl. C07c *103/34*

U.S. Cl. 260—558 R **10 Claims**

1. A one-step process for the preparation of an N-alkylarylcarboxamide or an N-alkylarylalkylcarboxamide which comprises reacting an aryl or an arylalkyl cyanide with an alkyl or cycloalkyl halide in the presence of water and a chloride of a metal selected from the group consisting of copper, iron, aluminum and zinc at a temperature in the range of from about 50° to about 250° C. and at a pressure in the range of from atmospheric to about 100 atmospheres, and recovering the resultant N-alkylarylcarboxamide.

3,883,591

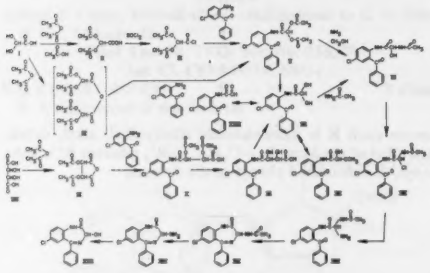
INTERMEDIATES FOR THE PREPARATION OF 1,3-DIHYDRO-2H-1,4-BENZODIAZEPIN-2-ONES

Ronald J. McCaully, Malvern, Pa., assignor to American Home Products Corporation, New York, N.Y.

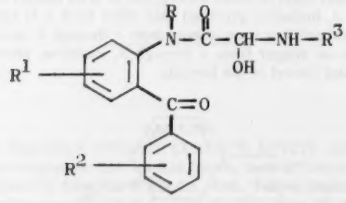
Division of Ser. No. 802,345, Feb. 26, 1969, Pat. No. 3,763,171. This application Feb. 15, 1973, Ser. No. 332,862

Int. Cl. C07c *103/50*

U.S. Cl. 260—562 N **2 Claims**



1. A compound of the structure:



wherein R is hydrogen, methyl, ethyl, propyl, allyl, methyl allyl, benzyl or phenylethyl; R^1 is hydrogen, lower alkyl, chlorine, bromine, trifuloromethyl, nitro, or methylsulfonyl; R^2 is hydrogen, lower alkyl, chlorine, bromine, trifluoromethyl, nitro, or methylsulfonyl; and R^3 is acetyl or propionyl.

3,883,592

THIOCARBAMYL SULFENAMIDES

Marion J. Gattuso, Hoffman Estates, and Robert J. Arnold, Chicago, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 20, 1972, Ser. No. 246,049

Int. Cl. C07d *87/46*

U.S. Cl. 260—567 **4 Claims**

1. N,N-dialkylthiocarbamyl-N'-phenylsulfenamide in which each alkyl contains from 1 to 10 carbon atoms.

3,883,593

10-NITRO-5H-DIBENZO(A,D)CYCLOHEPTEN-5-ONES AND SELECTED DERIVATIVES

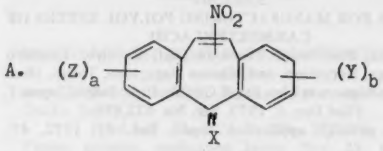
Gilbert H. Berezin, West Chester, Pa., and George Albert Boswell, Jr., Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Feb. 11, 1974, Ser. No. 441,658

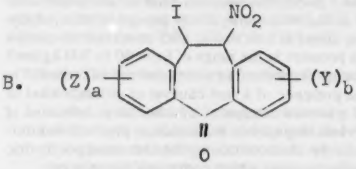
Int. Cl. C07c *49/76*, *49/80*, *49/82*

U.S. Cl. 260—590 **6 Claims**

1. A fungicidal compound having a formula selected from the group consisting of:



and



wherein

X is O;

Y and Z independently are halogen, nitro, CF_3, lower alkyl, lower alkoxy, lower alkylsulfonyl, and

a and *b* independently are 0–2, their sum being no greater than 2.

3,883,594

PROCESS FOR THE ACYLATION OF AROMATIC HYDROCARBONS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 11, 1974, Ser. No. 459,976

Int. Cl. C07c *49/76*

U.S. Cl. 260—592 **8 Claims**

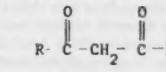
1. In a process for the acylation of an aromatic hydrocarbon with a carboxy acyl halide in contact with a Friedel-Crafts catalyst, the improvement which comprises reacting said aromatic hydrocarbon and carboxy acyl halide in the presence of a saturated hydrocarbon which contains at least one tertiary carbon atoms, or which is isomerized to form a saturated hydrocarbon containing a tertiary carbon atom during the reaction, and recovering the resultant acylated aromatic compounds.

3,883,595
PROCESS FOR THE PREPARATION OF BETA DICARBONYL

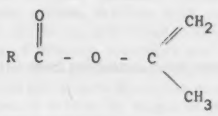
Edward S. Rothman, North Hills, and Gordon G. Moore, Willow Grove, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 41,573, May 28, 1970, abandoned. This application Dec. 19, 1973, Ser. No. 426,160
Int. Cl. C07c *49/02*
U.S. Cl. 260—595 **7 Claims**

1. A process for the preparation of symmetrical beta dicarbonyl compounds of the formula



wherein R is a straight chain alkyl group having from 7 to 17 carbon atoms, comprising heating at temperature of from about 20° to 50°C. in the presence of a saturated alkane solvent having a carbon chain length of from 5 to 10, aluminum chloride and an enol ester of the formula



wherein R is an alkyl group from 7 to 17 carbon atoms, said solvent dissolving both the aluminum chloride and the enol ester and being inert to the reactants and to the product.

3,883,596
FLUORINE AND SULFUR-CONTAINING COMPOSITIONS

Robert Bonner Hager, Collegeville; Sameeh Said Toukan, Phoenixville, and Gerald Joseph Walter, King of Prussia, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 283,886, Aug. 25, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 459,136
Int. Cl. C07c *149/18*
U.S. Cl. 260—609 R **5 Claims**

1. A twin-tailed alcohol of the structure: $[R_n(CH_2)_nSCH_2]_2$ CHOH wherein n is 1–12 is selected from

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3,883,597
PHOSPHORUS CONTAINING AROMATIC POLYMERS AND PROCESS FOR PRODUCING FLAME RESISTANT TEXTILES

Donald J. Daigle, New Orleans; George L. Drake, Jr., and Wilson A. Reeves, both of Metarie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 141,356, May 7, 1971. This application Mar. 28, 1972, Ser. No. 238,927
Int. Cl. C07f *9/28*
U.S. Cl. 260—606.5 P **10 Claims**

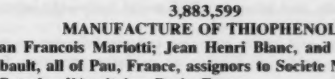
1. The phenolic methylol phosphine adduct obtained by reacting tris(hydroxymethyl)phosphine with a phenolic compound selected from the group consisting of phenol, o-cresol, m-cresol, p-cresol, catechol, resorcinol, hydroquinone, and phloroglucinol, in a molar ratio such that the number of methylol phosphorus radicals of the tris(hydroxymethyl)phosphine exceeds the number of hydrogen atoms attached to ring carbons ortho or para to the phenolic hydroxyl groups of the phenolic compound.

3,883,598
OXY, HYDROXY CONTAINING ALIPHATIC SULFIDES

James L. Guthrie, Ashton, and Shrikant V. Dighe, Silver Spring, both of Md., assignors to W. R. Grace & Co., Washington Research Center, Columbia, Md.

Filed Sept. 4, 1973, Ser. No. 393,862
Int. Cl.² C07C *149/18*
U.S. Cl. 260—609 R **3 Claims**

1. An ether thiol of the formula:



wherein R is the backbone of a saturated aliphatic polyol consisting of atoms of carbon, hydrogen and oxygen and free of reactive functional groups, said polyol containing up to 15 carbon atoms and m is an integer of 1 to 7.

3,883,599
MANUFACTURE OF THIOPHENOLS

Jean Francois Mariotti; Jean Henri Blanc, and Claude Thibault, all of Pau, France, assignors to Societe Nationale des Petroles d'Aquitaine, Paris, France

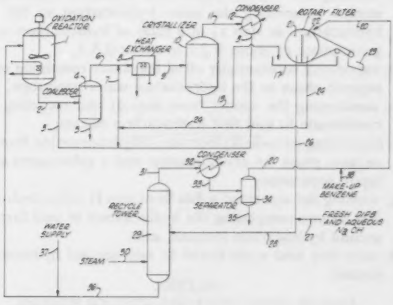
Filed Feb. 8, 1974, Ser. No. 440,844
Int. Cl. C07c *149/28*
U.S. Cl. 260—609 D **15 Claims**

1. Method of producing a thiophenol, which consists in heating the corresponding cyclohexylmercaptan in vapor state with sulfur dioxide and an inert gas, at a temperature of 300° to 800°C, in contact with a dehydrogenation catalyst the specific area of which is at least 300 square metres per gram, the contact being maintained until a substantial portion of the cyclohexylmercaptan is converted into thiophenol.

3,883,600
PRODUCTION OF PARADIALKYLBENZENE DIHYDROPEROXIDE

Glenn E. Miller, Pasadena, Tex., assignor to The Goodyear Tire and Rubber Company, Inc., Los Angeles, Calif.

Filed May 4, 1970, Ser. No. 34,455
Int. Cl. C07c *73/06*
U.S. Cl. 260—610 B **14 Claims**



1. In a continuous process for the production of paradialkylbenzene dihydroperoxide by the liquid phase oxidation of a para-dialkylbenzene selected from the group consisting of diisopropylbenzene and di(sec-butyl) benzene, with molecular oxygen in the presence of an aqueous alkali metal hydroxide wherein the oxidation reaction product is treated with hydrocarbon which forms a minimum boiling azeotrope with water, in which the dihydoperoxide is insoluble and the monohydroperoxide and dialkylbenzene are soluble at tem-

peratures below about 85°F and which is selected from the class consisting of benzene, toluene and xylene, the volume ratio of said hydrocarbon to the organic phase of said reaction product being at least about 0.05:1, and wherein paradialkylbenzene dihydroperoxide is subsequently separated as a solid in a solid-liquid separation step from the oxidation reaction product and the filtrate from said separation, containing paradialkylbenzene monohydroperoxide and unreacted paradialkylbenzene, are recycled to the oxidation reaction, the improvement comprising the steps of:

a. combining said filtrate with an amount of fresh feed dialkylbenzene sufficient to replace that consumed in the oxidation reaction and with an aqueous alkali metal hydroxide solution, in an amount such that the bottom product from step b) contains from about 0.05 about 0.15 percent by weight alkali metal hydroxide,

b. treating the mixture of filtrate, dialkylbenzene and aqueous alkali metal hydroxide in a steam stripping column to yield an overhead product comprising said hydrocarbon substantially free of dialkylbenzene and monohydroperoxide and a bottom product comprising dialkylbenzene, monohydroperoxide, and aqueous alkali metal hydroxide substantially free of the hydrocarbon,

c. recycling said steam stripping column bottoms product into the oxidation reactor as oxidation reaction feed material.

7. In a continuous process for producing paradialkylbenzene dihydroperoxide by the liquid phase oxidation of a para-dialkylbenzene hydrocarbon selected from the group consisting of diisopropylbenzene and di(sec-butyl) benzene, with moelcular oxygen in the presence of an aqueous alkali metal hydroxide and the subsequent recovery of paradialkylbenzene dihydroperoxide by crystallization from the organic phase separated from the oxidation reaction product, the improvement which comprises:

a. treating the oxidation reaction product with a first hydrocarbon stream comprising a hydrocarbon which forms a minimum boiling azeotrope with water, in which the dihydroperoxide is insoluble and the monohydroperoxide and dialkylbenzene are soluble at a temperature below about 85°F and which is selected from the class consisting of benzene, toluene and xylene, in a volume ratio of hydrocarbon to organic phase of said oxidation reaction product of at least about 0.05:1,

b. separating the mixture of said reaction product and said first hydrocarbon into an aqueous phase and an organic phase,

c. treating the organic phase with a second hydrocarbon stream comprising the same hydrocarbon as the first hydrocarbon in step a) in a ratio of hydrocarbon to organic phase of about 0.2:1 to about 0.5:1,

d. vaporizing substantially all of the water remaining in the organic phase as the hydrocarbon-water azeotrope,

e. condensing the vapors from step d) and recycling said condensate to said first hydrocarbon stream,

f. recovering para-dialkylbenzene dihydroperoxide from the organic phase by crystallization and a subsequent solid-liquid separation,

g. washing the separated solids from step f) with a hydrocarbon stream comprising the hydrocarbon of said first and second hydrocarbon streams, and

h. recycling said wash liquid to said second hydrocarbon stream.

3,883,601

4,4-METHYLENEBIS (2,6-DIARALKYLPHENOLS

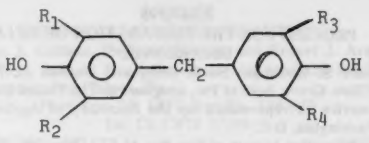
Gordon D. Brindell, Crystal Lake, and Rudy F. Macander, Cary, both of Ill., assignors to The Quaker Oats Company, Barrington, Ill.

Division of Ser. No. 253,342, May 15, 1972, Pat. No. 3,816,544. This application Mar. 11, 1974, Ser. No. 449,651

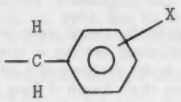
Int. Cl. C07c *43/20*

U.S. Cl. 260—613 R **3 Claims**

1. A composition of the formula:



wherein R_1, R_2, R_3, and R_4 are aralkyl groups of the following structure:



where X is alkoxy group containing from 1–13 carbon atoms.

3,883,602

PREPARATION AND ISOLATION OF CHLOROMETHYL METHYL ETHER BY SOLVENT EXTRACTION

Lawrence A. Ens, Ann Arbor, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 19, 1973, Ser. No. 380,776

Int. Cl. C07c *41/00*, *41/12*

U.S. Cl. 260—614 R **7 Claims**

1. A process for preparing chloromethyl methyl ether containing less than 5 ppm of bis(chloromethyl) ether comprising:

A. Saturating methylal with hydrogen chloride under essentially anhydrous conditions to form an equilibrium mixture of chloromethyl methyl ether, methylal, hydrogen chloride and methanol;

B. Selectively extracting the chloromethyl ether from the equilibrium mixture at a temperature of from −10° to 40°C with an inert liquid C_6–C_{12} aliphatic hydrocarbon having a boiling point between about 65° to 225°C and a limited solubility for methanol of less than 5 g/100 g liquid extractant at 20°C; and

C. Recovering chloromethyl methyl ether from the extractant liquid.

3,883,603

ADAMANTYL-(1)-β-NAPHTHOL

Yoshiaki Inamoto; Masaaki Takaku; Hirokazu Nakayama, and Morimasa Taniguchi, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1971, Ser. No. 208,913

Claims priority, application Japan, Dec. 23, 1970, 45-117165

Int. Cl. C07c *37/00*

U.S. Cl. 260—619 D **1 Claim**

1. An adamantyl-(1)-β-naphthol having a melting point of 194°–195°C.

3,883,604

PROCESS FOR PREPARING PERFLUOROALKYLIODIDE TELOMERS

Werner Rudolph, Anderten/Han.; Joachim Massonne, Hannover; Horst H. Jager, Bettingen, and Heinz Gress, Hannover, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed July 8, 1971, Ser. No. 165,849

Claims priority, application Germany, July 11, 1970, 2034472

Int. Cl. C07c *19/00*

U.S. Cl. 260—653.1 T 16 Claims

1. In a process for producing telomers of a perfluoroalkyl iodide or a perfluoroalkyl diiodide which comprises reacting a perfluoroalkyl iodide or a perfluoroalkyl diiodide containing not more than three carbon atoms in its molecular structure with perfluoroethylene, perfluoropropylene, or a monochloro-substituted perfluoroethylene or a monochloro-substituted perfluoropropylene at a temperature between 50° and 350°C and a pressure between 0 and 200 atmospheres in the presence of a catalyst the improvement comprising using the catalyst in the form of particles prepared by mixing together a metal salt of the group consisting of halides, phosphates, carbonates, nitrates, sulfates, cyanides, and hydrides of sodium, potassium, magnesium, calcium, strontium, barium, copper, silver, gold, zinc, cadmium, mercury, yttrium, titanium, zirconium, niobium, tantalum, ruthenium, rhodium, aluminum, indium, gallium, thallium, lead, vanadium, maganese, nickel, tin, antimony, and cobalt, and an amine of the group consisting of primary, secondary and tertiary alkylamines, cycloalkylamines, arylamines, and alkanolamines containing at least two and at most six carbon atoms or a mixture of the said amines in a ratio by weight of the metal salt to amine between 100 : 1 and 1 : 4, heating the mixture of said metal salt and amine at a temperature between 100° and 250°C, and, after cooling the catalyst mixture, comminuting the same.

3,883,605

PREPARATION OF 1,2-DICHLOROETHANE AND 1,1,2,2-TETRACHLOROETHANE BY OXYCHLORINATION

Albert Antonini, Paris; Claude Kaziz, La Courneuve, and Georges Wetroff, Le Thillay, all of France, assignors to Produits Chimiques, Pechiney-Saint-Gobain, France

Filed May 20, 1968, Ser. No. 730,608

Claims priority, application France, May 19, 1967, 67.106976

Int. Cl. C07c *17/00*

U.S. Cl. 260—658 R 15 Claims

1. A process for preparation of 1,2-dichloroethane and 1,1,2,2-tetrachloroethane containing less than 2 mole % chlorinated ethylenic derivatives by oxychlorination of ethylene and 1,2-dichloroethylene with a fluid bed catalyst comprising the steps of passing a gaseous mixture consisting essentially of molecular oxygen-containing gas, hydrochloric acid, ethylene and 1,2-dichloroethylenes, in which the ethylene makes up 40 to 95 molar % of the sum of the ethylene and dichloroethylenes and the ratio of HCl to the total of ethylene and dichloroethylenes is within the range of 1.6 to 2.4 and the ratio of oxygen to the total of ethylene and dichloroethylenes is within the range of 0.40 to 0.70, through a catalytic reaction zone at a temperature within the range of 200° to 360° C. with the catalytic reaction zone containing an oxychlorination catalyst deposited on a carrier having an average surface area within the range of 10–200 m^2/q in a fluidized state.

3,883,606

CONVERSION OF UNSATURATED COMPOUNDS

Robert L. Banks, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 4, 1971, Ser. No. 186,410

Int. Cl. C07c *3/62*

U.S. Cl. 260—678 12 Claims

1. A process for converting an unsaturated compound which comprises contacting at least one convertible unsaturated reactant selected from the group consisting of acyclic mono- and nonconjugated polyenes having at least 3 carbon atoms per molecule including cycloalkyl, cycloalkenyl, and aryl derivatives thereof; cyclic mono- and polyenes having at least 4 carbon atoms per molecule including alkyl and aryl derivatives thereof; mixtures of at least 2 of the above olefins; mixtures of ethylene and at least 1 of the above olefins; alkynes containing from 3 to about 20 carbon atoms per molecule and selected from the group consisting of cyclic and acyclic alkynes containing from 1 to about 5 triple bonds per molecule; mixtures of at least 2 of said alkynes; and mixtures of acetylene and at least 1 of the above alkynes with a catalyst comprising a promoter selected from the group consisting of oxides of tungsten, molybdenum and rhenium, on a support selected from the group consisting of silica and aluminum phosphate, and further promoted with an effective amount of an oxide of a rare earth metal having an atomic number of from 57 through 71, inclusive, under conditions suitable for converting said unsaturated reactant to a significant degree according to the olefin or alkyne reaction and the temperature is selected within the ranges in the following table for the specific catalyst utilized

Catalyst	Temperature Range, °F.
Rare Earth Metal Oxide/Tungsten Oxide/Silica	400–1100
Rare Earth Metal Oxide/Tungsten Oxide/Aluminum Phosphate	600–1200
Rare Earth Metal Oxide/Molybdenum Oxide/Silica	600–1100
Rare Earth Metal Oxide/Molybdenum Oxide/Aluminum Phosphate	600–1200
Rare Earth Metal Oxide/Rhenium Oxide/Silica	300–1100
Rare Earth Metal Oxide/Rhenium Oxide Aluminum phosphate	−60–1000.

3,883,607

OLEFIN HYDROGENATION USING H_nMoO_3

William C. Neikam, Chester, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 270,751, July 11, 1972, abandoned. This application Feb. 13, 1974, Ser. No. 442,268

Int. Cl. C07c *5/02*

U.S. Cl. 260—683.9 2 Claims

1. A process for hydrogenating an olefin which consists of contacting vapors of said olefin at a temperature of from about 75°C. to about 200°C. with a compound of the formula H_nMoO_3 where n is about 1.5 to about 2.5.

3,883,608
PROCESS FOR THE POLYMERIZATION OF DODECALACTAM IN THE PRESENCE OF POTASSIUM CARBONATE

Remy Hebert, Serquigny, France, assignor to Aquitaine Total Organico, Courbevoie, France

Continuation-in-part of Ser. No. 203,432, Nov. 30, 1971, Pat. No. 3,799,912. This application Jan. 21, 1974, Ser. No. 435,192

Claims priority, application France, Nov. 30, 1970, 70.42887

Int. Cl. C08g *20/18*

U.S. Cl. 260—78 L **14 Claims**

1. A process for the polymerization of dodecalactam to a moldable polyamide in which most of the polymerization operation is performed in the presence of water, at a temperature of between 280° and 335°C, using potassium carbonate as a catalyst.

3,883,609
SYNERGISTIC VULCANIZATES OF POLY-CARBORANYLENESILOXANE POLYMERS

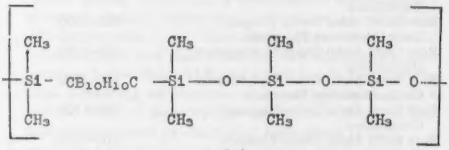
Trescott B. Larchar, Sr., Hamden, and Robert N. Scott, Wallingford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 1, 1973, Ser. No. 402,443

Int. Cl. C08g *47/02*

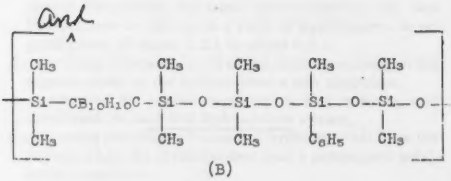
U.S. Cl. 260—825 **7 Claims**

1. A vulcanizate of a mixture of polycarboranylenesiloxane polymers A and B said polymers having recurring structural units of the formulas:



(A)

and



(B)

wherein from about 1:20 to about 1:1.67 parts of polymer B to parts of polymer A by weight are used.

3,883,610
CROSSLINKED POLYBENZOXAZOLE COPOLYMER AND A PROCESS FOR PREPARING THE SAME

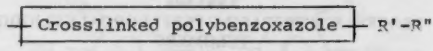
Jean Odier, Antony, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Aug. 14, 1973, Ser. No. 388,151

Int. Cl. C08g *37/16, 41/04*

U.S. Cl. 260—841 **7 Claims**

1. Crosslinked polybenzoxazole copolymer of the formula



in which R is a member selected from the group consisting of hydrogen and R';

R' is a member selected from the group consisting of O, OCH_2, NH and CH_2CHOH; and

R'' is phenoplast in an amount between 5 and 80% by weight of the whole.

3,883,611
COPOLYESTER(ETHYLENE TEREPHTHALATE/TETRAMETHYLENE DIBROMOTEREPHTHALATE) A NEW BLOCK POLYMER

James P. Nelson, Woodridge, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed June 15, 1972, Ser. No. 263,198

Int. Cl. C08g *39/02*

U.S. Cl. 260—860 **1 Claim**

1. The new composition of matter poly(ethylene terephthalate/tetramethylene dibromoterephthalate) consisting of a random structure of blocks of reoccurring structural units of 95 to 70 weight percent of poly(ethylene terephthalates) and 5 to 30 weight percent of poly(tetramethylene dibromoterephthalate).

3,883,612
LOW-SHRINK THERMOSETTING POLYMERS

Ivor Pratt, Tunbridge Wells, England, and Ulrich Boschert, Tallmadge, Ohio, assignors to SCM Corporation, Cleveland, Ohio

Filed Feb. 8, 1973, Ser. No. 330,474

Int. Cl. C08f *21/00*

U.S. Cl. 260—862 **7 Claims**

1. A low-profile molding resin composition for thickening with Group II metal oxides, hydroxides, or alkoxides, comprising:

a stable resin emulsion comprising by weight a mixture of at least 25% of a dicyclopentadiene terminated ethylenically unsaturated polyester polymer, about 5 to 20% of an acid functional thermoplastic polymer, and about 40 to 58% of an ethylenically unsaturated monomer;

said dicyclopentadiene polyester being the esterification product of an alpha,beta-ethylenically unsaturated dicarboxylic acid, dicyclopentadiene, and glycol, said dicarboxylic acid esterified with about 0.1 to 0.4 moles of dicyclopentadiene per mole of dicarboxylic acid; said polyester produced by first reacting a molar excess of said polycarboxylic acid with said glycol to produce an acid terminated prepolymer, and then reacting the dicyclopentadiene with said prepolymer and

said thermoplastic polymer being a copolymer of ethylenically unsaturated monomers comprising by weight from about 5–50% of (a) a lower alkyl ester of an unsaturated acid selected from the group of acrylic acid or methacrylic acid, and (b) an unsaturated acid selected from the group consisting of acrylic acid or methacrylic acid, and substantially the balance being (c) vinyl acetate, said thermoplastic polymer having an acid number of at least about 0.4.

3,883,613

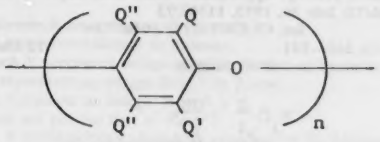
FLAME RETARDANT COMPOSITION OF POLYPHENYLENE ETHER, STYRENE RESIN AND TRIMESITYL PHOSPHATE AND PROCESS FOR THE PREPARATION THEREOF

Glenn D. Cooper, Delmar, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 4, 1972, Ser. No. 311,838
Int. Cl. C08g *43/02*
U.S. Cl. 260—874 **10 Claims**

1. A process for decreasing the self-extinguishing time of a normally flammable composition comprising

i. a polyphenylene ether of the formula



wherein the oxygen ether atom of one unit is connected to the benzene nucleus of the next adjoining unit; Q is a monovalent substituent selected from hydrogen, a hydrocarbon radical, a halohydrocarbon radical having at least two carbon atoms between the halogen atom and the phenol nucleus, hydrocarbonoxy radicals and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atom and the phenol nucleus; Q′ and Q″ are the same as Q and in addition, halogen, with the proviso that Q, Q′ and Q″ are all free of a tertiary alpha-carbon atom and *n* is a whole number of at least 50; and

ii. a styrene resin,

said process comprising adding a flame retardant compound consisting essentially of from about 0.5 to about 15 parts by weight of trimesityl phosphate per 100 parts by weight of component (i) and component (ii) to said composition.

3,883,614

ABS/VINYL ACETATE POLYMER BLENDS

Frederick Elias Carrock, Paramus, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed July 25, 1973, Ser. No. 382,438
Int. Cl. C08f *15/00, 19/00*
U.S. Cl. 260—876 R **10 Claims**

1. A polymeric molding composition with improved environmental stress crack resistance comprising an ABS type graft polymer formed by copolymerizing on a rubbery base material a mixture of (1) a monovinyl aromatic compound in which the vinyl group is attached directly to a carbon atom of the aromatic nucleus and (2) a non-aromatic vinyl or vinylidene monomer and, blended with said ABS type graft polymer, a vinyl acetate polymer at least 50% of which by weight represents vinyl acetate, the amount of said vinyl acetate polymer being at least 0.5% but less than 50% of the weight of it and said ABS type graft copolymer combined.

3,883,615

FLAME-RETARDANT IMPACT-RESISTANT RESIN COMPOSITION

Teizo Kudo; Shinji Tokuhara, and Keiichi Chata, all of Saitama, Japan, assignors to Daicel Ltd., Higashi-ku, Osaka, Japan

Filed Aug. 13, 1973, Ser. No. 388,052
Claims priority, application Japan, Aug. 24, 1972, 47-84830
Int. Cl. C08f *15/00, 19/00*
U.S. Cl. 260—876 R **5 Claims**

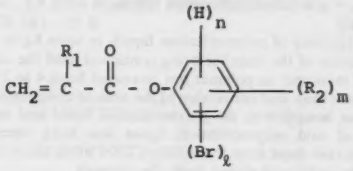
1. A flame-retardant, impact-resistant resin composition, consisting essentially of

A. rubber-modified copolymer, containing admixed therein,

B. from 10 to 20 parts by weight, per 100 parts by weight of copolymer A, of chlorinated polyethylene, chlorinated ethylene-propylene copolymer, chlorinated ethylene-butene copolymer or chlorosulfonated polyethylene, having a chlorine content of from 25 to 45 percent by weight,

said copolymer A comprising (a) from 3 to 30 percent by weight of rubber component and (b) from 97 to 70 percent by weight of resin component, said resin component (b) consisting of

1. at least 40 percent by weight of resin component (b) of aromatic monoalkenyl compound,
2. from 15 to 35 percent by weight of resin component (b) of a compound, or mixture of compounds of the formula



wherein

R_1 is H or CH_3,

R_2 is alkyl of one to 4 carbon atoms, or chlorine,

l is an integer of 2, 3, 4 or 5,

m and *n* each is an integer of 0, 1, 2 or 3 provided that the sum of *l*+*m*+*n* is 5;

3. the balance of ethylenically unsaturated monomer copolymerizable with said aromatic monoalkenyl compound.

3,883,616

PROCESS FOR PREPARING RUBBER-CONTAINING STYRENE RESINS

Yukio Hozumi; Saizo Ikeda, both of Osaka, and Toshikazu Hayaoka, Saitama, all of Japan, assignors to Daicel Ltd., Osaka, Japan

Filed May 1, 1973, Ser. No. 356,145
Claims priority, application Japan, May 4, 1972, 47-44331
Int. Cl. C08f *7/02*
U.S. Cl. 260—880 R **8 Claims**

1. In a process for preparing rubber-containing styrene resins, in which a solution of (A) from 2 to 20 parts by weight of butadiene synthetic rubber, dissolved in (B) 100 parts by weight of monovinyl aromatic monomer or monomer mixture comprising monovinyl aromatic monomer and monomer copolymerizable therewith, is subjected to bulk polymerization at least until phase inversion has occurred and then is subjected to suspension polymerization to obtain the resin product, in which the bulk polymerization is carried out in a vessel having wall means defining a circulatory flow path for the solution undergoing polymerization and having an impeller for effecting circulatory flow of the solution through said path and imposing shear on the rubber particles that form in the solution during bulk polymerization, the improvement in the bulk polymerization step which consists essentially of rotating said impeller beginning at the latest by the time when phase inversion commences, and thereby continuously and repeatedly circulating the entirety of the polymerization liquid during the remainder of the bulk polymerization step in unidirectional, non-turbulent, laminar flow through a shear zone at a uniform rate of from 4 to 36 circulations per minute of the entirety of the polymerization liquid and in the range calculated by the formula

$$-0.064x^2+3x+6 > \text{number of cycles of circulation}$$

of the entire polymerization liquid per minute > $-0.064x^2+3x-10$, wherein x is the weight of rubber dissolved in 100 parts of (B),

said shear zone being defined by a radial flow turbine impeller whose blades extend substantially to the wall of said path whereby said shear zone extends substantially entirely across said path so that as the polymerization liquid moves unidirectionally through the shear zone its direction of flow is changed by said blades from a direction parallel to the axis of rotation of said impeller to a direction radially thereof, and said polymerization liquid is simultaneously subjected to a uniform shear force at a mean shear rate of from 60 to 200 sec^{-1}

wherein mean shear rate $= 2.7 \sqrt{P_v G_c/\mu}$

in which

P_v = power consumption for operating the impeller per unit volume of the polymerization liquid, in units Kg/sec. m^2

G_c = gravitation conversion factor, in units Kg . m/Kg sec^2

μ = viscosity of polymerization liquid, in units Kg/m . sec

the rotation of the impeller being continued until the conversion of monomer to polymer has increased from 4 to 35 percent more than said conversion at the time of commencement of phase inversion in the polymerization liquid and the entirety of said polymerization liquid has been circulated through said shear zone from 200 to 2200 times and is higher than the value calculated from the formula

$$-3.84x^2 + 180x - 600,$$

wherein x has the same meaning as defined above.

3,883,617

RESIN MASSES COMPRISING A METHYL METHACRYLATE POLYMER MATRIX AND A STYRENE POLYMER DISPERSE PHASE

Manfred Krieg, Darmstadt, and Adolf Wohnhas, Darmstadt-Arheilgen, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed May 22, 1973, Ser. No. 362,719

Claims priority, application Germany, May 26, 1972, 2225578

Int. Cl. C08f *29/50*

U.S. Cl. 260—883 **9 Claims**

1. A thermoplastically formable synthetic resin mass adaptable to the preparation of light-diffusing shaped bodies, said mass comprising 98 to 99.99 parts by weight of

A. a polymer having an index of refraction between 1.47 and 1.52 which is

A 1. a homopolymer of methyl methacrylate or

A 2. a copolymer formed from a monomer mixture comprising at least 70 percent by weight of methyl methacrylate and at most 30 percent by weight of at least one other monovinyl or monovinylidene monomer copolymerizable with methyl methacrylate; and 0.01 to 2 parts by weight of a cross-linked styrene copolymer having an index of refraction greater than 1.52 and less than 1.59 dispersed in component (A) in the form of particles having an average diameter between 0.5 and 30 microns, said copolymer being the product obtained by the thermal cross-linking of at least one thermally cross-linkable copolymer (B) comprising

B 1. 70 to 99 percent by weight of styrene and

B 2. 1 to 30 percent by weight of at least one monovinyl or monovinylidene monomer having mutually reactive hydroxymethylamide side groups or alkoxymethylamide side groups having 1 – 6 carbon atoms in the alkyl portion thereof, said resin mass being prepared by dissolving said thermally cross-linkable copolymer (B), in the presence of a free-radical forming polymerization initiator, in methyl methacrylate or said monomer mixture, heating to a temperature below about 100°C. to initiate polymerization; and, after completion of the polymerization, during which said cross-linkable copolymer precipitates in particulate form, heating the resultant resin mass to a temperature above 100°C. to effect cross-linking of said cross-linkable copolymer to form said cross-linked copolymer.

3,883,618

O-ALKYL-S-ALKYL-O-(1-HYDROCARBYLOXY CARBONYL 1-PROPEN-2-YL)-DITHIOPHOSPHATES

Alexis A. Oswald, Mountainside; Paul L. Valint, Woodbridge, and George N. Schmit, Scotch Plains, all of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

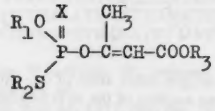
Filed Sept. 6, 1973, Ser. No. 394,694

Claims priority, application Switzerland, Sept. 8, 1972, 13226/72; July 30, 1973, 11103/73

Int. Cl. C07f *9/16;* **A01n** *7/36*

U.S. Cl. 260—941 **12 Claims**

1. A compound of the formula



wherein R_1 represents methyl or ethyl, R_2 represents alkyl with 3 to 5 carbon atoms, R_3 represents alkyl with 1 to 3 carbon atoms, allyl, alkinyl with 3 to 6 carbon atoms, benzyl, α-methylbenzyl, methoxyethyl, methoxy-ethoxyethyl or 1-methyl-2-methoxyethyl, and X represents oxygen or sulphur.

3,883,619

PHOSPHORUS AND ALCOHOLIC HYDROXY CONTAINING POLYETHERS AND THEIR PRODUCTION

Herbert Jenkner, Cologne, Germany, assignor to Chemische Fabrik Kalk GmbH, Cologne, Germany

Filed Apr. 8, 1974, Ser. No. 459,269

Claims priority, application Germany, Apr. 12, 1973, 2318328

Int. Cl. C07f *9/32*

U.S. Cl. 260—952 **4 Claims**

1. A process for the production of alcoholic hydroxy group and phosphorus-containing polyethers suitable for the formation of soft and semi-hard polyurethane foam in which white phosphorus is reacted with an alkali metal hydroxide, water and a lower alkanal in the presence of a lower alkanol at a temperature between about 30° and 75°C., the quantities of alkali metal hydroxide, water and alkanal respectively supplied to the reaction being about 0.75 to 0.85, 0.75 to 0.85 and 2 to 4 mol per g.-atom of white phosphorus, to produce a reaction mixture containing a reaction product primarily comprising an alkali metal salt of a bis-(hydroxyalkane)-phosphinic acid, adding sufficient mineral acid to the reaction mixture to convert the said alkali metal salt of the phosphinic acid to the free acid, distilling off the volatile components to leave a product consisting essentially of the free bis-(hydroxyalkane)-phosphinic acid and reacting said free phosphinic acid with at least one epoxy compound at a temperature between about 30° and 160°C., the quantity of epoxy compound being such as to provide at least 2 mole per g.-atom of phosphorus contained in said free phosphinic acid, to produce said alcoholic hydroxy group and phosphorus-containing polyether, the improvement which comprises reacting said alcoholic hydroxy group and phosphorus-containing polyether compound with an anhydride of a monocarboxylic acid having form two to four carbo atoms at a temperature of from about 20° to 120°C., with agitation to produce a reaction product primarily comprising the 2 to 4 carbon acid ester of the said polyether.

4. The product of the process of claim 1.

3,883,620
POLYHALOALKYL PHOSPHATE ESTERS

Richard J. Turley, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 21, 1973, Ser. No. 334,336
Int. Cl. C07f 9/16
U.S. Cl. 260—963 12 Claims

1. A tetrahalobutyl phosphate ester having the formula

$$(Y_3CCH_2CHCH_2O)_n \underset{X}{|} \quad \overset{O}{\overset{\|}{P}}(OR)_m$$

wherein R represents methyl or ethyl,
X represents chlorine or bromine,
each Y represents independently chlorine or bromine,
n represents an integer from 1 to 3, and
m represents an integer from 0 to 2,
with the proviso that $m + n = 3$.

6. A tetrahalobutyl phosphate ester having the formula

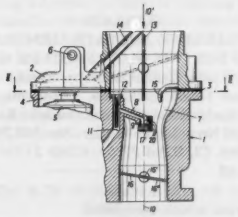
$$(Y_3CCH_2CHO)_n \underset{CH_2X}{|} \quad \overset{O}{\overset{\|}{P}}(OR)_m$$

wherein
R represents an alkyl group having 1 to 4 carbon atoms,
X represents chlorine or bromine,
each Y represents independently chlorine or bromine,
n represents an integer from 1 to 3, and
m represents an integer from 0 to 2,
with the proviso that $m + n = 3$.

3,883,621
CARBURETOR FOR INTERNAL COMBUSTION ENGINES

Georg Hammerschmied, Leonhardstrasse 52, Graz, Austria

Filed Jan. 10, 1973, Ser. No. 322,535
Claims priority, application Austria, Jan. 14, 1972, 343/72; Oct. 25, 1972, 9135/72
Int. Cl. F02m 19/08
U.S. Cl. 261—78 R 7 Claims

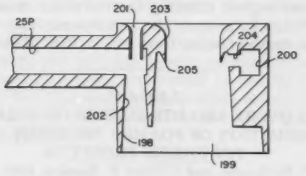


1. A carburetor for internal combustion engines comprising a suction pipe for combustion air having a first suction pipe portion and a second suction pipe portion adjoining the former in the direction of the combustion air flow, a throttle valve located in the second suction pipe portion and rotatable around an axis extending in transverse relation to the axis of the suction pipe, a fuel outlet arm arranged in said first suction pipe portion and presenting a fuel outlet, a screen having grid-like perforations and arranged in said first suction pipe portion adjacent the fuel outlet arm, said screen forming at the most an acute angle with the axis of the suction pipe and providing flow control surfaces for the combustion air in the suction pipe, and said fuel outlet arm protruding radially into the suction pipe and presenting a laterally flattened portion to which said screen is attached in spaced relation.

3,883,622
AIR VALVE PRESSURE DIAPHRAGM CARBURETOR

Stephen Woods, 311 Mason, Ann Arbor, Mich. 48103

Continuation-in-part of Ser. No. 335,550, Feb. 26, 1973, Pat. No. 3,796,413, which is a continuation-in-part of Ser. No. 175,539, Aug. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 846,563, July 31, 1969, Pat. No. 3,618,904, which is a continuation-in-part of Ser. No. 822,828, April 9, 1969, Pat. No. 3,556,067, which is a continuation-in-part of Ser. No. 629,488, April 10, 1967, abandoned. This application Jan. 14, 1974, Ser. No. 433,196
Int. Cl. F02m 19/08
U.S. Cl. 261—78 R 9 Claims

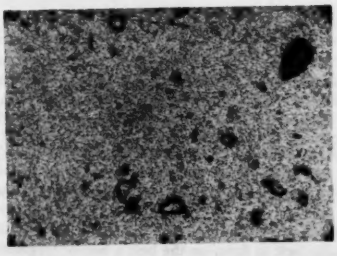


1. In a carburetor, an air intake passage having an annular restriction forming a main venturi, a booster venturi member disposed in the throat of said main venturi and having a through air passage provided with an annular restriction forming a booster venturi, said booster venturi member having a fuel channel surrounding said through air passage, axially extending venturi apertures opening into said fuel channel to admit air thereinto from the upstream side of said booster venturi member to disperse and atomize fuel in said fuel chamber, and outlet apertures respectively aligned with said venturi apertures and leading from said fuel channel to discharge the air and dispersed and atomized fuel from said fuel channel to the downstream side of said booster venturi member.

3,883,623
PROCESS FOR CONTROLLING END-POINT DENSITY OF SINTERED URANIUM DIOXIDE NUCLEAR FUEL BODIES AND PRODUCT

Kenneth W. Lay, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 17, 1972, Ser. No. 298,255
Int. Cl. G21c 21/00
U.S. Cl. 264—0.5 4 Claims



1. A process for controlling end-point density of a sintered uranium dioxide nuclear fuel body by forming discrete low density porous regions therein comprising the steps of provid-

ing uranium dioxide powder having an oxygen to uranium atomic ratio ranging from about 2.00 to 2.25 and ranging in size up to about 10 microns, admixing said uranium dioxide powder with a precursor to uranium dioxide having an average agglomerated particle size significantly larger than that of the uranium dioxide powder and ranging from about 20 microns to one millimeter, said precursor being a solid and having a density lower than that of uranium dioxide, forming the resulting mixture into a green body having a density ranging from about 30% to 70% of theoretical, said green body has a structure composed of a substantially uniform matrix of the uranium dioxide powder with discrete low density regions of said precursor therein, said precursor being used in an amount which results in said discrete low density regions in the green body ranging from about 5% to 25% by volume of said green body, heating said green body to decompose said precursor before reaching sintering temperature, and sintering the body to produce a sintered body having discrete low density porous regions with a density significantly lower than that of the surrounding sintered uranium dioxide, said discrete low density porous regions reducing the end-point density of said sintered body by at least 2%, said sintered body having an end-point density ranging from 85% to 95% of theoretical.

3,883,624

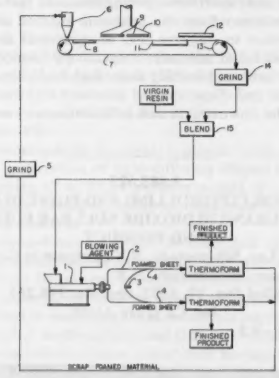
RECOVERY AND UTILIZATION OF SCRAP IN PRODUCTION OF FOAMED THERMOPLASTIC POLYMERIC PRODUCTS

Robert P. McKenzie, and Clifford P. Ronden, both of Edmonton, Alberta, Canada, assignors to Grandview Industries, Limited, Alberta, Canada

Continuation of Ser. No. 200,057, Nov. 18, 1971, abandoned. This application May 15, 1973, Ser. No. 360,558

Int. Cl. B29h *19/00*

U.S. Cl. 264—37 **5 Claims**



1. The method for converting foamed polystyrene scrap into particulate material having a bulk density approximately equal to that of virgin polymeric material used to form said scrap and suitable for re-extrusion into foamed polystyrene sheet, comprising grinding the scrap into fragments,

at least 90% of the resulting ground scrap having a particle size larger than 10 mesh,

the ground scrap having maximum dimension not exceeding 1 in.;

continuously depositing said fragments on a moving endless metallic belt to form on the belt a bed of fragments,

said bed having a depth of 0.25–3.5 in.;

continuously advancing the belt, with said bed supported thereon, through a heating zone and thereby heating said fragments to a temperature above the fusion temperature of polystyrene but below the thermal degradation temperature thereof,

said fragments fusing during passage through the heating zone, and the resulting bodies of fused polystyrene joining with the bodies of fused polystyrene from adjacent fragments,

the initial depth of said bed of fragments being such that the total fused polystyrene is inadequate to cover the surface area of the belt, and the fused polystyrene therefore forming on the belt as a reticulated layer;

then continuously advancing the belt, with the reticulated layer of fused polystyrene supported thereon, through a cooling zone and thereby cooling the belt and the fused polystyrene to a temperature not exceeding about 55°F., whereby the fused material is caused to solidify into a thin, brittle reticulated web;

bending the belt away from said reticulated web, whereby said web is separated from said belt and said web is broken into individual pieces; and grinding said pieces to produce particles of solid polystyrene of a size suitable for extrusion.

3,883,625

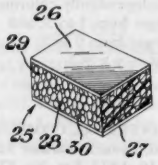
METHOD FOR MAKING EXPANDABLE PLASTICS

Lowell S. Thomas, and Kenneth J. Cleereman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 14,882, Feb. 12, 1970, abandoned, which is a division of Ser. No. 691,299, Dec. 18, 1967, abandoned. This application Mar. 29, 1973, Ser. No. 345,885

Int. Cl. B29d *27/00*

U.S. Cl. 264—45.6 **8 Claims**



2. The method of claim 1 including heat forming the laminate during heating of the inner layer wherein both the inner and outer layers are raised to a heat forming temperature.

3,883,626

POROUS CELLULOSE ACETATE MEMBRANE AND A PROCESS FOR THE MANUFACTURE OF SAME

Kenji Kamide, Kyoto; Seiichi Manabe; Etsuko Osafune, both of Osaka, and Tomio Sakamoto, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Nov. 22, 1972, Ser. No. 308,769

Int. Cl. B29d *27/04*; **C08b** *21/04*

U.S. Cl. 264—49 **11 Claims**

1. A process for the manufacture of a cellulose acetate porous membrane which comprises:

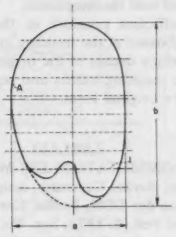
a. dissolving in a main organic solvent cellulose acetate having an acetyl content of 20 to 62.5%, the cellulose acetate being dissolved in the solvent in a weight ratio of 5 to 40% relative to the solvent,

b. adding to the solution a diluent solvent having a boiling point higher than the main solvent,

c. adding to the resulting solution a metal salt, wherein the metal is selected from Groups I–III of the Periodic Table and has an ionic radius of less than 1.33 A, said metal salt being added to the solution in a weight ratio of 20 to 200% relative to the acetate to provide a homogeneous solution,

d. casting the resulting solution onto a polished plane surface to form a thin film,

e. removing the solvent from the film by evaporation at a temperature of less than 50°C and



f. removing the metal salt from the film by dissolving the salt therefrom to produce a porous membrane.

3,883,627

MOLDING PROCESS FOR PRODUCING SUBSEQUENT ARTICLES FROM A MASTER

Martin Fitts, Portland, Oreg., assignor to Cook Paint and Varnish Co., Kansas City, Mo.

Filed June 6, 1973, Ser. No. 367,361

Int. Cl. B29c *1/02, 17/04, 7/00*

U.S. Cl. 264—51 **6 Claims**

1. A molding process comprising:

1. placing a heat curable elastomeric sheet material comprising curing agent and urethane elastomeric gum stock or silicone gum stock over a master which is to be copied, said heat curable elastomeric sheet material being one which does not cause inhibition between the master and the heat curable elastomeric sheet material;
2. vacuum drawing the sheet material against the master;
3. enclosing the master sheet material within a frame;
4. then forming a foamed polymeric backing in situ to force the heat curable elastomeric sheet material against the master to copy the shape of the master in the heat curable elastomeric sheet material;
5. curing the elastomeric sheet material in the shape of the master; and
6. molding articles in the shape of the master in a mold constructed from the cured elastomeric sheet material.

3,883,628

SILICONE RELEASE AGENT

Eugene Ray Martin, Onsted, Mich., assignor to Stauffer Chemical Company, Adrian, Mich.

Filed May 14, 1973, Ser. No. 360,276

Int. Cl. C08f *11/04;* **C08g** *31/02*

U.S. Cl. 264—54 **10 Claims**

9. The process of claim **8** wherein a gaseous expanding agent is generated in the reaction mixture resulting from the reaction of said organic polyisocyanate with the organic compound before said reaction mixture has gelled and become tack-free, whereby the polyurethane articles obtained are cellular.

3,883,629

INJECTION MOLDING OF LAMINAR ARTICLES HAVING A FOAM CORE AND AN INTEGRAL SKIN

Paul Johnson Garner, Thorpe Bay, and David Fairclough Oxley, St. Albans, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 887,751, Dec. 23, 1969, abandoned. This application Sept. 12, 1972, Ser. No. 288,328

Claims priority, application United Kingdom, Dec. 31, 1968, 61963/68

Int. Cl. B29d *27/00, 9/00*

U.S. Cl. 264—55 **10 Claims**

1. In an injection molding process for the production of laminar articles having a core of a synthetic polymeric resin composition enclosed by a skin of a dissimilar synthetic polymeric resin composition, wherein a molten charge of an injection moldable skin forming synthetic polymeric resin composition is injected into a mold cavity and, before the interior of the skin forming composition has set, a molten charge of an injection moldable core forming synthetic polymeric resin composition is injected into the interior of the skin forming composition, and the compositions are maintained in the mold cavity until they have set, the improvement comprising filling the mold cavity with said skin forming composition and then injecting the core forming composition so that the injection pressure of the core forming composition forces the mold cavity to enlarge to accommodate the core forming composition as it is injected.

3,883,630

PROCESS FOR THE RECOVERY OF SYNTHETIC FIBRILS

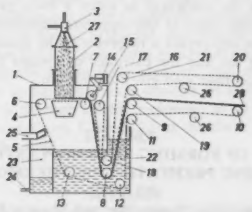
Carlo Raganato, Castiglioncello, Italy, assignor to Solvay & Cie, Brussels, Belgium

Filed Sept. 6, 1972, Ser. No. 286,683

Claims priority, application Italy, Sept. 9, 1971, 63876/71

Int. Cl. B29b *5/04*

U.S. Cl. 264—102 **11 Claims**



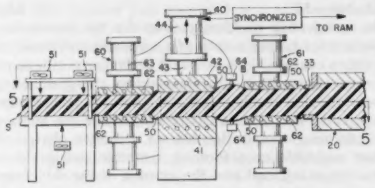
1. In a process for the recovery of synthetic polymer fibrils which are in the presence of vapors of an organic solvent, the improvement comprising the steps of

1. passing a movable porous support through a closed vessel which is maintained free of air and contains water vapors, which water vapors are of a liquid which is immiscible with the organic solvent and inert in relation to the polymer of which the fibrils are composed, said water vapors acting to reduce condensation of the solvent vapors in the closed vessel and having a partial pressure between 5% and 80% of the total pressure prevailing in the vessel;
2. introducing the fibrils and organic solvent vapors into the vessel and depositing the fibrils in the form of a sheet onto the movable porous support in the vessel;
3. continuously extracting the solvent vapors from the vessel by suction; and
4. continuous extracting from the vessel the sheet of fibrils formed in the vessel by passing it through a hydraulic seal constituted by water in the form of a liquid phase to remove any remaining traces of solvent from the fibrils.

3,883,631
METHOD AND MEANS FOR MAKING HIGH MOLECULAR WEIGHT POLYETHYLENE SHEETS

Coyt E. Murray, Gastonia, N.C., assignor to Impact Plastics, Incorporated, Gastonia, N.C.

Continuation of Ser. No. 596,932, Nov. 25, 1966, abandoned. This application Aug. 21, 1969, Ser. No. 860,145
Int. Cl. B29f 3/08
U.S. Cl. 264—210 R 16 Claims



1. A method of transforming high molecular weight polyethylene having a molecular weight of at least 1,000,000 from granular resin to a solid state which comprise:

a. heating the resin above its crystalline melting point,

b. moving the heated resin in one direction through an extruder of given cross-sectional internal dimension while confining the resin against radial movement and while cooling the resin to an amorphous state within the extruder,

c. moving the amorphous resin in said one direction beyond the extruder and across an air space and into a finishing die spaced sufficiently close to the extruder to engage the resin in its amorphous condition and spaced beyond the extruder a distance sufficient to permit formation of a reservoir of resin in the air space between the extruder and the finishing die,

d. applying inward pressure on the amorphous resin at the finishing die sufficient to exert a back pressure on the amorphous resin in the opposite direction to said one direction and create a reservoir in the space between the finishing die and the extruder of greater cross-sectional dimension than said given dimension.

3,883,632
METHOD OF FORMING THERMOPLASTIC MATRIX INCLUDING PREHEATING OF THERMOPLASTIC BLANKS

Robert P. Petrochko, Somerville, and Thomas E. Hayes, High Bridge, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,882
Int. Cl. B41c 3/06; B29d 9/06; B29b 3/00
U.S. Cl. 264—322 7 Claims

1. A process for forming a highly accurate thermoplastic matrix which comprises:

a. placing an original form on the lower platen of a press;

b. covering the exposed surface of said original form with a thin layer of insulating material;

c. placing a thermoplastic matrix blank over said insulating material;

d. covering said matrix blank with a metallic release plate;

e. closing said press and applying pressure to said matrix blank not greater than essentially contact pressure while applying heat sufficient to raise the temperature of said thermoplastic blank to a point above the softening point, but below the flow point of said thermoplastic while maintaining the said original form at a temperature below the point at which sufficient softening of the original form occurs to cause significant deformation of said original form when said pressure is applied;

f. opening said press and removing said insulation material, matrix blank and release plate;

g. stripping said insulation material from the surface of said matrix blank;

h. reinserting said matrix blank and release plate into said press so as to place the exposed surface of said matrix blank in contact with said original form;

i. closing said press and supplying sufficient heat to said matrix blank to raise the temperature of at least a portion of said thermoplastic matrix blank to a point above the flow point of said thermoplastic;

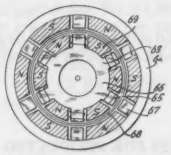
j. applying sufficient pressure so that the thermoplastic blank is embossed at the molding interface so as to replicate the surface details of the original form; and

k. cooling the resulting matrix and separating the said matrix from the original form.

3,883,633
COMMUTATORLESS MOTOR

Wolfgang Kohler, Berlin, Germany, assignor to Akademie der Wissenischaften der DDR, Berlin, Germany

Filed Feb. 4, 1974, Ser. No. 438,985
Int. Cl. H02k 29/02
U.S. Cl. 310—152 21 Claims



1. A commutatorless motor comprising an iron-free rotor having drive coils and rectifying means connected to the drive coils, and a stator comprising poles of constant magnetic field strength arranged with alternating polarity, pole means adapted to provide an alternating magnetic field and mounted between poles of constant magnetic field strength, and coil means on said pole means, said coil means comprising means for coupling energy to the motor for driving said rotor, said drive coils being the sole coils on said rotor.

3,883,634
LIQUID-LIQUID EXTRACTION OF GERMANIUM FROM AQUEOUS SOLUTION USING HYDROXY-OXIMES

Archille DeSchepper, Lichtaart, and Antoine Van Peteghem, Olen, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Apr. 26, 1974, Ser. No. 464,387
Claims priority, application Belgium, May 14, 1973, 67596
Int. Cl. B01d 11/04; C01g 17/00
U.S. Cl. 423—89 16 Claims

1. A process for liquid-liquid extraction of germanium from an aqueous solution, in which an organic liquid containing hydroxy-oxime is used as extractant comprising contacting an aqueous solution containing germanium and an acid selected from the group consisting of 10 to 500 grams per liter of hydrochloric acid, 10 to 500 grams per liter of sulfuric acid, and 10 to 100 grams per liter of hydrofluoric acid, with an organic liquid selected from the group consisting of non-diluted hydroxy-oxime, a solution of hydroxy-oxime in an aliphatic solvent, a solution of hydroxy-oxime in an aromatic solvent, and a solution of hydroxy-oxime in a mixture of an aliphatic and an aromatic solvent, separating the organic liquid phase containing extracted germanium from the residual aqueous phase, and recovering the extracted germanium from the separated organic phase by contacting with an agent selected from the group consisting of water, acids, and bases.

3,883,635

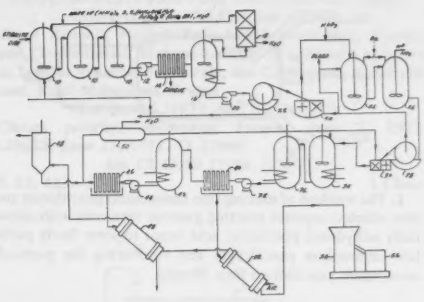
HYDRO-METALLURGICAL PREPARATION OF THE OXIDES OF ANTIMONY AND ANTIMONIC ACID

Booker W. Morey, Pasadena, and John Richard McKinley, Claremont, both of Calif., assignors to Occidental Petroleum Corp., Los Angeles, Calif.

Continuation of Ser. No. 213,929, Dec. 30, 1971, abandoned. This application June 6, 1973, Ser. No. 367,451

Int. Cl. C01b *29/00*; C01c *1/00*; C01b *17/00*

U.S. Cl. 423—87 15 Claims



1. A process for the production of antimony oxide and/or antimonic acid from stibnite-bearing ores and ore concentrates which comprises:

a. contacting the stibnite-bearing ore with an aqueous leach solution comprising from about 5 to about 30% by weight ammonium sulfide and from about 0.1 to about 10 percent by weight sulfur at a temperature from ambient to about 90°C to form an ore gangue and a mother liquor containing extracted antimony sulfide;

b. separating the mother liquor from the gangue;

c. eliminating ammonia from the mother liquor and forming a precipitate of antimony sulfide and sulfur;

d. reacting the formed precipitate with an aqueous oxidizing nitric acid solution containing from 1 to about 70 percent by weight nitric acid at a temperature from ambient to about 150°C and a pressure from atmospheric to about 300 psig to form a slurry of insoluble sulfur and antimony compounds selected from the group consisting of the oxides of antimony and antimonic acid in the nitric acid solution;

e. separating the sulfur and antimony compounds from the nitric acid solution; and

f. separating the sulfur from the antimony compounds.

3,883,636

CHLORINATION PROCESS

Colin Francis Cole, and Kenneth Arkless, both of Teeside, England, assignors to British Titan Limited, Billingham, Teeside, England

Continuation-in-part of Ser. No. 321,969, Jan. 8, 1973, abandoned, which is a continuation of Ser. No. 775,906, Nov. 14, 1969, abandoned. This application Jan. 24, 1973, Ser. No. 326,415

Claims priority, application United Kingdom, Nov. 17, 1967, 52511/67

Int. Cl. C01g *23/02*

U.S. Cl. 423—74 17 Claims

1. In a process for chlorinating a finely divided titaniferous material at least 30 percent by weight of which has a particle size greater than 180 microns in a fluidized bed in the presence of a carbonaceous reducing agent, the improvement comprising increasing the efficiency of chlorination, as measured by the chlorine utilization or CO ratio of the gases produced in the chlorination reaction, by conducting the chlorination in the presence of an added source of an element selected from the group consisting of chromium, lanthanum, and vanadium, in an amount of from 0.01 to 2.5 percent by weight expressed as the additive element based on the weight of titanium dioxide in the titaniferous material.

3,883,637

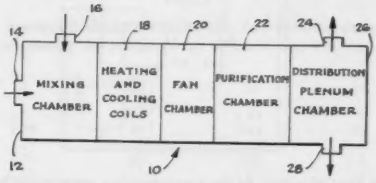
CATALYTIC METHOD OF PURIFICATION OF AIR FOR MOTOR VEHICLE PASSENGER COMPARTMENT

John W. Benedict, Louisville, Ky., assignor to Girdler Chemical, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 128,925, March 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 779,030, Nov. 26, 1968, abandoned. This application June 25, 1973, Ser. No. 373,396

Int. Cl. B01d *46/00*

U.S. Cl. 423—230 6 Claims



1. A method for removing air-borne sulfur compounds from air entering a motor vehicle passenger compartment through a ventilation conduit system, said method consisting of essentially of the steps of impregnating a selected quantity of activated charcoal with selected copper compounds in amounts such that said activated charcoal contains from about 0.5 percent to about 5 percent by weight as free copper and from about 0.25 percent to about 3 percent by weight as free chromium in proportions such that the molar ratio of copper to chromium is from about 1:1 to about 8:1, mixing the impregnated charcoal so formed with an emulsion of liquid and a soluble thermal setting binder consisting essentially of polyvinyl acetate and solvent until the mixture becomes tacky; placing said mixture in a mold of selected configuration, pressing the mixture to form a briquette, and heating the briquette as formed to set the binder to form said impregnated charcoal into a catalytically active filter element, and mounting said filter element in the ventilation conduit of said vehicle and passing said air through the filter element at an hourly space velocity of from about 5 times 10 to the forth to about 1.5 times ten to the sixth.

3,883,638

PROCESS FOR REMOVING SULFUR DIOXIDE AND SULFUR TRIOXIDE FROM WASTE GAS AND PRODUCING SULFUR THEREFROM

Philippe Renault, Noisy-le-Roi; Claude Dezael, Maisons-Laffitte; Andre Deschamps, Chatou, and Sigismond Franckowiak, Montesson, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, France

Filed Mar. 15, 1973, Ser. No. 341,468

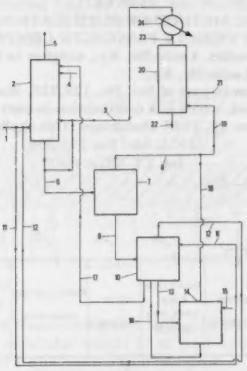
Claims priority, application France, Mar. 15, 1972, 72.09117

Int. Cl. C01b *17/04*

U.S. Cl. 423—242 5 Claims

1. In a process for purifying a waste gas containing sulfur dioxide and sulfur trioxide, wherein the waste gas is contacted with ammonia and water, so as to obtain an aqueous solution of ammonium salts, containing ammonium sulfites and sulfates, this solution is heated up to a sufficient temperature for converting the ammonium sulfites to sulfur dioxide and ammonia, at least a portion of said sulfur dioxide is reacted with hydrogen sulfide, so as to obtain sulfur, and the ammonia is recycled to the waste gas contacting zone, the improvement comprising the additional step of further heating the solution to 160°–300°C., the sulfites of which have been converted, so

as to melt the ammonium sulfates, treating it with at least a portion of the waste gas before contact of said portion with ammonia and water, said portion being thereafter contacted with said ammonia and water, so as to transform the ammo-



nium neutral sulfate to the corresponding ammonium hydrogen sulfate, reacting the latter with a reducing agent at 150°–350°C., so as to convert it to sulfur dioxide and ammonia and treating said sulfur dioxide and ammonia as above indicated.

3,883,639

METHOD OF REMOVING SULFUR-CONTAINING GASES FROM WASTE GAS

Walter A. Cronkright, Jr., Somerville, N.J., and Bernard G. Mandelik, Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 171,267, Aug. 12, 1971, abandoned. This application Dec. 21, 1972, Ser. No. 317,484

Int. Cl. C01b *17/00*

U.S. Cl. 423—242 **10 Claims**

1. A process for removing sulfur dioxide from industrial waste gas which comprises:

scrubbing waste gas in a contacting zone with an aqueous medium having a pH below 7.1 containing clacium carbonate, carbon dioxide and at least about 3 weight percent of a soluble sulfate selected from the group consisting of sodium, lithium, potassium, magnesium, and ammonium sulfates;

precipitating solids selected from the group consisting of calcium sulfite and calcium sulfate from the aqueous medium;

removing a portion of said solids; and

introducing a remaining portion of the solids with said aqueous medium to the contacting zone.

3,883,640

SODIUM PERCARBONATE CRYSTALS

James Crosby Smart, Runcorn, England, assignor to Imperial Chemical Industries Limited, Millbank, London, SW1P 4QG, England

Filed Jan. 15, 1973, Ser. No. 323,351

Claims priority, application United Kingdom, Jan. 26, 1972, 3680/72

Int. Cl. C01c *15/10*

U.S. Cl. 423—415 P **2 Claims**

1. In a process for the preparation of sodium percarbonate crystals from an aqueous solution of sodium percarbonate, the improvement which comprises incorporating in the said aqueous solution a water soluble acrylic polymer polyelectrolyte the concentration of said polyelectrolyte being between 10 and 10,000 parts per million by weight of sodium percarbonate to be crystallized from the said solution.

3,883,641

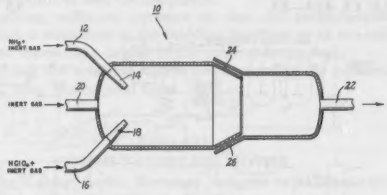
VAPOR PHASE METHOD OF MAKING AMMONIUM PERCHLORATE

Raymond Conrad, Russellville, Ala., assignor to Thiokol Corporation, Bristol, Pa.

Filed Feb. 22, 1971, Ser. No. 117,513

Int. Cl. C01b *11/18*

U.S. Cl. 423—476 **6 Claims**



1. The method of making fine ammonium perchlorate particles which comprises reacting gaseous ammonia with substantially anhydrous perchloric acid vapor to form finely particulate ammonium perchlorate and recovering the particulate ammonium perchlorate thus formed.

3,883,642

PRODUCING CONCENTRATED HYDROFLUORIC ACID SUBSTANTIALLY FREE FROM IMPURITIES USING POLYETHER AND POLYOL ABSORBENTS AND NITROGEN FLUSHING GAS

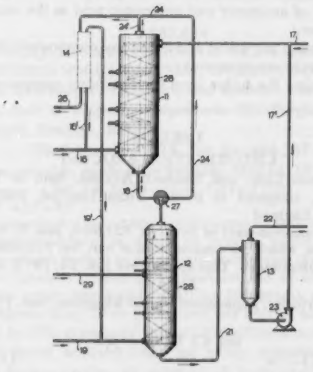
Bruno Franke; Erich Hallbauer, both of Castrop-Rauxel, and Wolfgang Laue, Waltrop, all of Germany, assignors to BUSS Aktiengesellschaft, Basel, Switzerland

Continuation of Ser. No. 248,940, May 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 805,757, March 10, 1969, abandoned. This application June 5, 1973, Ser. No. 367,102

Claims priority, application Germany, Mar. 9, 1968, 1667537

Int. Cl. C01b *7/22*

U.S. Cl. 423—483 **8 Claims**



1. A process for producing concentrated hydrofluoric acid substantially free of SiF_4 from a fluid material selected from the group consisting of (1) solutions of fluorine compounds including H_2SiF_6 and (2) gaseous mixtures containing HF, SiF_4 and H_2O, which comprises treating the fluid as a solute in an absorption column at a temperature of at least 100°C with a solvent comprising a selectively absorbent organic selected

from the group of aliphatic polyethers and polyols, flushing the solvent carrying the solutes with oxygen-free nitrogen countercurrent to the solvent in a stripping column separate from the absorption column at a temperature of at least 100°C, the nitrogen thereby taking off SiF_4 and H_2O, removing (1) the nitrogen loaded with SiF_4 and H_2O and (2) the solvent separately from the stripping column and thereafter separating the hydrofluoric acid from the solvent.

3,883,643

PROCESS FOR PURIFYING INDUSTRIAL GASES CONTAINING SULFUR DIOXIDES

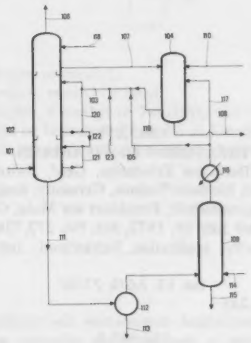
Philippe Renault, Noisy-le-Roi; André Deschamps, Chatou, and Claude Dezael, Maisons-Laffitte, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed June 6, 1972, Ser. No. 260,279

Claims priority, application France, June 7, 1971, 71.20628; June 23, 1971, 71.22966

Int. Cl. C01b *17/04, 17/60*

U.S. Cl. 423—574 **1 Claim**



1. A process for purifying an industrial gas which simultaneously contains sulfur dioxide and at least one of oxygen and sulfur trioxide, comprising the steps of:

a. contacting said gas with an aqueous solution of ammonia and/or of ammonium sulfite in a contact zone so as to form additional ammonium sulfite and sulfate in said aqueous solution, and then separating the gas from said aqueous solution,

b. contacting the gas separated from the aqueous solution in step a) with water in an additional contact zone at 0°–100°C, so as to obtain a dilute aqueous solution of ammonium sulfite and a further purified gas,

c. alternatively contacting said dilute solution of ammonium sulfite with a first bed and a second bed of weak anionic resin, thereby retaining SO_2 thereon and recovering therefrom dilute ammonia solution,

d. heating the aqueous solution separated from step a) to form a gaseous mixture of H_2O, SO_2 and NH_3,

e. reacting said gaseous mixture from step (d) with H_2S in a reaction zone to form sulfur and recovering ammonia therefrom,

f. alternatively passing a portion of recovered ammonia in the condensed form through said first bed and said second bed of weak anionic resin to form a solution of ammonium sulfite, provided one only of the beds is contacted with said condensed form while the other is contacted with the dilute solution of step (c), and

g. passing said solution containing ammonium sulfite recovered from step (f) to the contact zone of step (a).

3,883,644

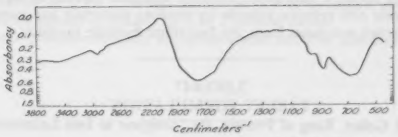
ALUMINUM HYDRIDE

Norman E. Matzek, Midland, and Donald F. Musinski, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 23, 1962, Ser. No. 234,277

Int. Cl. C01b *6/00*

U.S. Cl. 423—645 **1 Claim**



1. A novel, crystalline substantially non-solvated aluminum hydride having the unique X-ray diffraction as follows:

d	I/I_1	*d*	I/I_1
5.6	100	1.44	5
3.28	60	1.41	12
3.21	10	1.395	5
2.79	60	1.281	6
2.29	12	1.271	2
2.12	50	1.144	5
1.855	3	1.123	0.8
1.77	3	1.090	0.8
1.635	7	1.060	2
1.61	8	1.045	0.8
1.60	8	1.015	3
1.57	3	1.004	0.8
1.54	2		

and an infrared spectrum having significant absorption maxima at 640 cm^{-1}, 680 cm^{-1}, 870 cm^{-1}, 955 cm^{-1}, 1,020 cm^{-1}, 1,650 cm^{-1} and 1,760 cm^{-1}

3,883,645

PREPARATION OF BERYLLIUM HYDRIDE

Charles R. Bergeron, Baton Rouge, and Ralph W. Baker, Greenwall Springs, both of La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 365,232, April 30, 1964, abandoned. This application Dec. 8, 1967, Ser. No. 690,712

Int. Cl. C01b *6/00*

U.S. Cl. 423—645 **14 Claims**

1. In a process for the preparation of beryllium hydride which comprises pyrolyzing, while in a solvent inert under the reaction conditions with respect to reactants and products and at a temperature in the range of from about 150° to about 220°C. sufficient to result in the formation of beryllium hydride, a compound selected from the group consisting of beryllium dialkyls and etherates thereof wherein each alkyl radical contains from 4 to 20 carbon atoms, the pyrolysis being carried out under an atmosphere inert under the reaction conditions with respect to reactants and products, the improvement which comprises agitating the reaction mixture during the course of the reaction in such manner as to introduce mechanical energy into the reaction mixture at the rate of from about 0.002 to about 0.30 horsepower per gallon of the said reaction mixture.

3,883,646

PREPARATION OF BERYLLIUM HYDRIDE

Charles B. Roberts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 28, 1967, Ser. No. 694,786

Int. Cl. C01b *6/04*

U.S. Cl. 423—645 **3 Claims**

1. A process for preparing a beryllium hydride product which comprises:

a. reacting beryllium borohydride and aluminum hydride trimethylamine adduct in quantities sufficient to provide a $Be(BH_4)_2/AlH_3.N(CH_3)_3$ molar ratio of at least 3/2, said reaction being conducted at from about room temperature to about 60°C. for a period of from about 5 minutes to about 2 hours, and in the presence of an inert, substantially moisture free atmosphere, and

b. heating the resulting product mass at a temperature of from about 75° to about 100°C. and a maximum pressure of about 1 millimeter mercury absolute thereof to separate and remove volatile by-product materials and unreacted reactants from the beryllium hydride product.

3,883,647

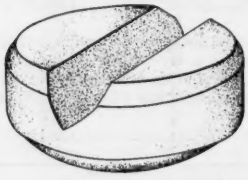
TABLET FORMULATION

Ehud Geller, King of Prussia, Pa., assignor to Ives Laboratories, New York, N.Y.

Filed Dec. 6, 1972, Ser. No. 312,469

Int. Cl. A61j *3/10;* **A61k** *9/00*

U.S. Cl. 424—15 **5 Claims**



1. A pharmaceutical tablet which is adequately imprinted with indicia or embossing and scored to form a groove which is one-third to two-thirds the depth of the total tablet thickness to facilitate separation into subdivisions containing substantially equal amounts of a pharmaceutically active ingredient comprising a directly compressed formulation of 5 to 10 milligrams of an active ingredient, the remainder being 45 to 99.7 percent by weight of microcrystalline cellulose and 0.3 to 0.4 percent by weight of magnesium stearate, along with fillers, extenders, flavoring and the like.

3,883,648

METHOD OF MAKING STABLE GRANULES OF N-4-[2-(5-CHLORO-2-METHOXYBENZAMIDO)-ETHYL]-HENYLSULFONYL-N'-CYCLOHEXYL UREA AND ITS SALTS AND PROCESS FOR PREPARING SAME

Gerhard Ross, Liederbach, Taunus, and Bernhard Reul, Schneidhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 29, 1973, Ser. No. 410,311

Claims priority, application Germany, Oct. 31, 1972, 2253318; Oct. 31, 1972, 2253317

Int. Cl. A61k *27/12*

U.S. Cl. 424—44 **4 Claims**

1. A method for making stable granules of N-4-[2-(5-chloro-2-methoxybenzamido)ethyl]-phenylsulfonyl-N'-cyclohexyl urea or a physiologically compatible salt thereof which comprises preparing a solution or a dispersion of said compound or salt in a melt of a water-soluble carrier material selected from the group consisting of polyglycols having a molecular weight of from 2000 to 20000, addition products thereof with propylene oxide, and mixtures of said polyglycols or addition products with pharmacologically compatible surface-active substances, together with at least an amount of an alkali metal carbonate or bicarbonate effective to stabilize said compound or salt against the temperatures of the melt, and then solidifying the molten mass into droplet granules.

3,883,649

JOLIPEPTIN AND THE PROCESS FOR PRODUCING THE SAME

Mikiko Ito, and Yasuo Koyama, both of Tokyo, Japan, assignors to Kayaku Antibiotic Research Co., Ltd., Japan

Filed Nov. 9, 1972, Ser. No. 305,081

Int. Cl. A61k *21/00*

U.S. Cl. 424—118 **2 Claims**

1. A process for producing the jolipeptin, which comprises cultivating a strain of *Bacillus polymyxa subsp. colistinus* KOYAMA, ATCC No. 21830 in a cultured broth containing a nitrogen source and a carbon source at a culture temperature of about 28° – 35°C, until a sufficient amount of jolipeptin has been imparted too said broth.

3,883,650

TREATMENT OF FILARIASIS

Ernst Albert Hermann Friedheim, Genf, Switzerland, and Dieter Duwel, Hofheim/Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

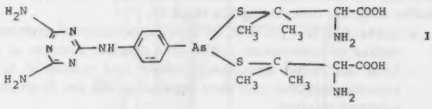
Filed July 18, 1972, Ser. No. 272,726

Claims priority, application Switzerland, July 20, 1971, 10701/71

Int. Cl. A61k *27/00*

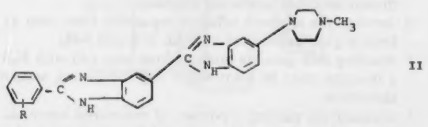
U.S. Cl. 424—245 **6 Claims**

1. A pharmaceutical composition for treating filariasis, which comprises, a therapeutically effective amount of a phenylarsenicdithio compound of the formula



I

and an effective therapeutic amount of a compound of the formula



II

wherein R is hydroxy, methoxy, ethoxy or chlorine or the physiologically tolerable salts thereof, the molar ratio of compound I to compound II being between 1: 1.5 and 1:3.

3,883,651

PHARMACEUTICAL COMPOSITIONS CONTAINING A 2-(AMINOALKYLAMINO)-4-AMINO-THIENO[3,2-D]PYRIMIDINE AND METHOD OF USE

Eberhard Woitun; Berthold Narr, and Wolfgang Schroter, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

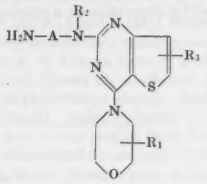
Division of Ser. No. 60,933, Aug. 4, 1970, Pat. No. 3,838,121. This application Aug. 22, 1974, Ser. No. 499,460

Claims priority, application Germany, Aug. 8, 1969, 1940572; July 2, 1970, 2032686; July 2, 1970, 2032687

Int. Cl. A61u *27/00*

U.S. Cl. 424—248 11 Claims

1. A pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective platelet inhibiting amount of a compound of the formula



wherein

R_1 is hydrogen or methyl,

R_2 is hydrogen, methyl or ethyl,

R_3 is hydrogen, 6-methyl or 7-methyl, and

A is straight or branched alkyl of 2 to 6 carbon atoms, or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

3,883,652

CERTAIN SUBSTITUTED-TRICYCLIC QUINAZOLIN-THIONES USED AS BRONCHODILATORS

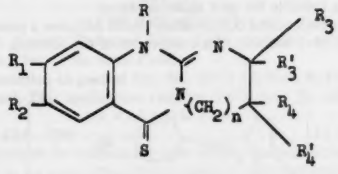
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz-Wander, Inc., East Hanover, N.J.

Filed Jan. 19, 1973, Ser. No. 325,078

Int. Cl. A61k *27/00*

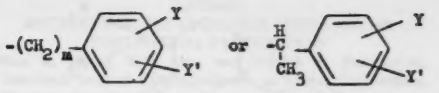
U.S. Cl. 424—251 5 Claims

1. A method of effecting bronchodilation in mammals in need thereof comprising administering to said mammals, a bronchodilating effective amount of a compound of the formula:



wherein each of R_1 and R_2 is, independently, hydrogen, fluoro chloro or alkyl of 1 to 3 carbon atoms, or both are alkoxy of 1 to 2 carbon atoms; or one is hydrogen and the other bromo or alkoxy of 1 to 2 carbon atoms, n is 0 or 1;

each of R_3, R'_3, R_4 and R'_4 is hydrogen or alkyl of 1 to 3 carbons provided that no more than 3 of R_3, R'_3, R_4 and R'_4 are alkyl, R is alkyl of 1 to 6 carbon atoms,



m is 1 or 2, each of Y and Y′ is, independently, hydrogen, fluoro, chloro or alkyl of 1 to 3 carbon atoms, or both are alkoxy of 1 to 2 carbon atoms, or one is hydrogen and the other bromo or alkoxy of 1 to 2 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

3,883,653

METHOD OF PREVENTING ASTHMATIC SYMPTOMS

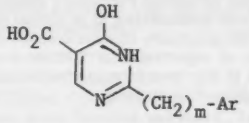
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 24, 1972, Ser. No. 299,871

Int. Cl.² A61K *27/00*

U.S. Cl. 424—251 6 Claims

1. A method of preventing asthmatic symptoms in a human who is subject to bronchoconstriction, said method comprising administering to said human about 20 to 200 mg. per day of a compound selected from the group consisting of



and the pharmaceutically acceptable basic salts thereof wherein Ar is selected from the group consisting of phenyl and substituted phenyl wherein said substituent is selected from the group consisting of methyl, methoxy, hydroxy, nitro, chloro, fluoro, 3,4-dimethoxy, 3,4,5-trimethoxy and alkanoylamino having from 2 to 3 carbon atoms and m is an integer of 0 or 1.

3,883,654

BASIC QUINOBENZAZEPINES COMPOSITIONS AND METHODS OF USE

Gerhard Hackmack, Aumuhle, and Heinz Gunter Menge, Dettingen, both of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Konstanz, Germany

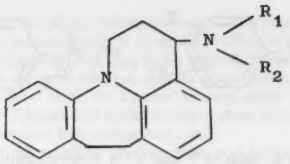
Continuation-in-part of Ser. No. 112,046, Feb. 2, 1971, Pat. No. 3,830,818. This application Feb. 21, 1974, Ser. No. 444,427

Claims priority, application Germany, Feb. 3, 1970, 2004818

Int. Cl. A61k *27/00*

U.S. Cl. 424—258 11 Claims

1. A pharmaceutical composition containing a pharmaceutical carrier and, as active agent, a pharmacologically-active concentration of a 2,3,7,8-tetrahydro-1H-quino[1,8-ab][1]benzazepine compound selected from the group consisting of a 3-amino-2,3,7,8-tetrahydro-1H-quino[1,8-ab][1]benzazepine of the formula



wherein each of R_1 and R_2 is a member selected from the group consisting of hydrogen and alkyl with 1 to 4 carbon atoms, and the pharmaceutically-acceptable acid-addition salt thereof.

3,883,655

ERGOCORNINE OR 2-BROMO-α-ERGOCYPTINE IN THE TREATMENT OF PARKINSONISM

Kjell Fuxe, Stockholm, Sweden, assignor to Sandoz Ltd., Basel, Switzerland

Filed Oct. 11, 1973, Ser. No. 405,463
Int. Cl. A61k *27/00*
U.S. Cl. 424—261 **5 Claims**

1. A method of treating Parkinson's disease in an animal which comprises administering to an animal in need of such treatment a therapeutically effective dose for treating Parkinson's disease of ergocornine or 2-bromo-α-ergocyptine as active agent in free base form in pharmaceutically acceptable acid addition form thereof.

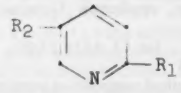
3,883,656

PHARMACEUTICAL PREPARATIONS FOR THE TREATMENT OF HYPERTONIA

Phyllis Roberta Hedwall, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 30, 1972, Ser. No. 302,156
Claims priority, application Switzerland, Nov. 11, 1971, 16377/71; Sept. 15, 1972, 13545/72
Int. Cl. A61k *27/00*
U.S. Cl. 424—263 **10 Claims**

1. A pharmaceutical preparation for treating hypertonia which contains an effective amount of an antihypertensive amino acid compound selected from the group consisting of an α-amino-α-methyl-β-(hydroxylated phenyl)-propionic acid, a non-toxic salt thereof and a lower alkyl ester thereof; and an effective amount of a β-hydroxylase inhibitor compound selected from the group consisting of a compound of the formula



wherein R_1 is an esterified, amidised or free carboxyl group and R_2 is an alkyl group, a non-toxic salt thereof, bis-(diethylthiocarbamoyl)-disulphide and bis-[(3-aza-3-methylhexylene-1,6)-thiocarbamoyl]-disulphide.

3,883,657

5,5-DIMETHYL-10-HYDROXY-8-(3-METHYL-2-OCTYL)--(2-PROPYNYL)-1,2,3,4-TETRAHYDRO-5H-[1]-BENZOPYRANO[3,4-D]PYRIDINE AS A SEDATIVE HYPNOTIC

Louis Selig Harris, Richmond, Va.; Harry George Pars, Lexington, Ill.; Raj Kumar Razdan, Belmont, Ill., and Anthony Thomas Dren, Waukegan, Ill., assignors to Sharps Associates, Cambridge, Mass.

Continuation-in-part of Ser. No. 283,436, Aug. 24, 1972. This application May 3, 1974, Ser. No. 466,541
Int. Cl. A61k *27/00*
U.S. Cl. 424—263 **2 Claims**

1. A method of inducing and/or prolonging sleep, without significantly reducing REM sleep, comprising administering a therapeutically effective amount of 5,5-dimethyl-10-hydroxy-8-(3-methyl-2-octyl)-2-(2-propynyl)-1,2,3,4-tetrahydro-5H-[1]benzopyrano[3,4-d]pyridine to a mammalian patient.

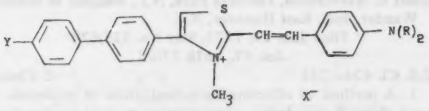
3,883,658

METHOD OF TREATING NEMATODE INFESTATIONS

Arthur P. Phillips, Raleigh, and Robert B. Burrows, Cary, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

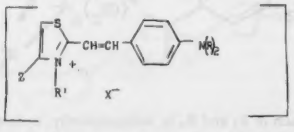
Continuation-in-part of Ser. No. 760,966, Sept. 19, 1968, Pat. No. 3,641,012, and a continuation-in-part of Ser. No. 760,965, Sept. 19, 1968, abandoned. This application May 24, 1971, Ser. No. 146,549
Int. Cl. A01n *9/02*; **A61k** *27/00*
U.S. Cl. 424—270 **43 Claims**

1. A nematocidal composition which contains a nematocidally effective amount of a compound of the formula



where Y is hydrogen, where R is methyl and where X^- is an anion of a pharmaceutically acceptable acid and a carrier therefor suitable for oral administration.

8. A nematocidal composition which contains a nematocidally effective amount of a compound of the formula



where Y is selected from the group consisting of lower alkoxy and hydrogen, wherein R′ is lower alkyl and where X^- is an anion of a pharmaceutically acceptable acid and a carrier therefore suitable for oral administration.

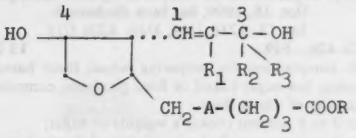
3,883,659

9-OXAPROSTAGLANDIN COMPOSITIONS

Isidoros Vlattas, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 18, 1973, Ser. No. 361,694
Int. Cl. A61k 27/00
U.S. Cl. 424—285 3 Claims

1. A pharmaceutical composition comprising a a compound, corresponding to the formula



wherein each of R and R_3 is lower alkyl, lower alkenyl, lower alkynyl, (3 to 7 ring-membered cycloalkyl or cycloalkenyl)-C_mH_{2m} wherein m is an integer from 0 to 4, or Ph-C_nH_{2n}, wherein Ph is phenyl, (lower alkyl)-phenyl, (lower alkoxy)-phenyl, (lower alkylenedioxy)-phenyl, (halogeno)-phenyl, (trifluoromethyl)-phenyl, (nitro)-phenyl or (di-lower alkylamino)-phenyl and n is an integer from 1 to 4, or R is also hydrogen, Ph, an alkali metal or one equivalent of an alkaline earth metal and R_3 is also (lower alkoxy or halo)-lower alkyl, A is ethylene or ethenylene, R_1 and R_2 are hydrogen or lower alkyl, or the 1,2-dihydro-derivatives thereof containing no double-bond at the 1-chain-carbon atom in an amount sufficient for producing a prostaglandin-like effect, together with a pharmaceutical excipient.

3,883,660

TREATMENT OF PAIN, FEVER OR INFLAMMATION WITH 5-FLUORO-2-METHYL-1-CP-METHYLSULFINYL-BENZYLIDENE)-3-INDENYLACETALDEHYDE

Tsung-Ying Shen, Westfield, and Howard Jones, Holmdel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 248,291, April 27, 1972, abandoned. This application Sept. 7, 1972, Ser. No. 287,130
Int. Cl. A61k 27/00
U.S. Cl. 424—303 2 Claims

2. A method of treating pain, fever or inflammation which comprises administering to a host a therapeutically effective amount of 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-3-indenylacetaldehyde.

3,883,661

ACNE TREATMENT

John M. Young, Redwood City, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 197,117, Nov. 9, 1971, abandoned. This application Oct. 16, 1973, Ser. No. 406,937
Int. Cl.² A61K 27/00
U.S. Cl. 424—320 12 Claims

1. A method for controlling acne which comprises topically applying to an acne affected skin area an effective amount of a composition consisting essentially of a pharmaceutically acceptable carrier and about 0.1% to about 30% of a diethanolamide of a saturated or unsaturated alkanoic acid containing from 12 to 18 carbon atoms, inclusive, and permitting said composition to remain on said acne affected skin area to allow the percutaneous absorption thereof into the sebaceous glands of the skin, whereby the acne condition in the treated area is controlled.

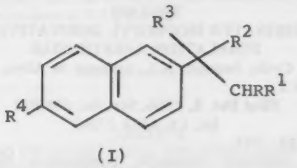
3,883,662

METHOD FOR DELAYING THE ONSET OF, OR POSTPONING, PARTURITION

Milan R. Henzl, Palo Alto, and Adolph P. Roszkowski, Saratoga, both of Calif., assignors to Syntex Corporation, Panama, Panama

Filed Mar. 29, 1973, Ser. No. 345,879
Int. Cl.² A61K 27/00
U.S. Cl. 424—333 10 Claims

1. A method comprising administering to a pregnant mammal a compound selected from the group of compounds represented by the formula:



(I)

wherein, R is hydrogen and R^1 is hydroxy or a conventional hydrolyzable ester thereof; or R and R^1 together form =O; one of R^2 and R^3 is hydrogen, the other is hydrogen, methyl, ethyl or difluoromethyl; or R^2 and R^3 taken together are methylene, halomethylene or ethylene; and R^4 is alkyl, cycloalkyl, trifluoromethyl, vinyl, ethynyl, fluoro, chloro, alkoxy, alkoxymethyloxy, difluoromethoxy, alkylthio, alkoxymethylthio or difluoromethylthio; said compound being administered in a therapeutically effective amount adapted to delay the onset of parturition or to postpone parturition.

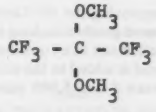
3,883,663

ANESTHETIZING COMPOSITION AND METHOD

George L. Moore, South Plainfield, and Ross C. Terrell, Plainfield, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Division of Ser. No. 168,379, Aug. 2, 1971, Pat. No. 3,745,220. This application Mar. 16, 1973, Ser. No. 341,909
Int. Cl. A61k 27/00
U.S. Cl. 424—341 2 Claims

1. A method of anesthetizing an anesthetic-susceptible mammal which comprises administering to the mammal an anesthetically-effective amount of an aliphatic ether compound of the formula



as an inhalation anesthetic, while administering life supporting amounts of oxygen.

3,883,664

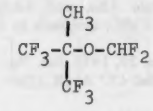
HEXAFLUORO-T-BUTYL DIFLUOROMETHYL ETHER AS AN INHALATION ANESTHETIC

Louise S. Croix, Summit, N.J., assignor to Airco, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 326,481, Jan. 29, 1973, abandoned, which is a continuation of Ser. No. 174,957, Aug. 8, 1971, abandoned. This application May 9, 1974, Ser. No. 468,478
Int. Cl. A61k 27/00
U.S. Cl. 424—342 2 Claims

2. A method of anesthetizing an anesthetic-susceptible mammal which comprises administering to the mammal an

anesthetically effective amount of hexafluoro-t-butyl difluoromethyl ether of the formula:



as an inhalation anesthetic while administering life-supporting amounts of oxygen.

3,883,665

FLUORINATED ISOPROPYL DERIVATIVES AS INHALATION ANESTHESIAS

Louise S. Croix, Summit, N.J., assignor to Airco, Inc., New York, N.Y.

Filed Dec. 8, 1966, Ser. No. 600,011
Int. Cl. A61k *27/00*
U.S. Cl. 424—342 **4 Claims**

1. A respirable anesthetic composition comprising 1,1,1,3,3,3-hexafluoroisopropyl methyl ether, having the formula $(CF_3)_2CHOCH_3$ in admixture with a sufficient amount of oxygen to support life and in suitable proportions for the production of anesthesia.

3,883,666

CHEWING GUM BASE AND CHEWING GUM MADE THEREFROM

James Teng, St. Louis County, and Marcella C. Stubits, St. Louis, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Mar. 11, 1974, Ser. No. 450,052
Int. Cl. A23g *3/00, 3/30*
U.S. Cl. 426—3 **5 Claims**

1. A chewing gum comprising as an essential ingredient a chewing gum base of a hydroxypropyl starch acetate.

3,883,667

IMPROVING GOUDA CHEESE FLAVOR

Hendrik Jan Hofman, and Dirk Sloot, both of Vlaardingen, Netherlands, assignors to Lever Bros. Company, New York, N.Y.

Filed June 21, 1973, Ser. No. 372,112
Claims priority, application United Kingdom, June 21, 1972, 29052/72
Int. Cl. A23l *1/26*
U.S. Cl. 426—538 **8 Claims**

1. A process for improving the old Gouda cheese flavor of an edible Gouda flavored product lacking in old Gouda cheese flavor, in which a calcium salt of an unsubstituted mono- or di-C_4 to C_8 carboxylic acid is added to the edible Gouda flavored product to give between 1 and 5,000 ppm of the salt in said edible product.

3,883,668

IMPROVING GOUDA CHEESE FLAVOR

Dirk Sloot, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed June 21, 1973, Ser. No. 372,113
Claims priority, application United Kingdom, June 21, 1972, 29053/72; June 21, 1972, 29054/72
Int. Cl. A23l *1/26*
U.S. Cl. 426—535 **7 Claims**

1. In a process for enhancing or imparting an old Gouda-cheese flavor to a Gouda flavored food product, lacking in said old Gouda cheese flavor, the improvement comprising adding to the food product **2,4-dithiapentane**, and/or trans-anethole to give between **0.005** and **0.05** ppm of dithiapentane and/or between **0.05** and **5** ppm trans-anethole in the food product.

3,883,669

METHOD OF INCREASING THE PROTEIN CONTENT OF WHEAT FLOUR BASED, LOW SHORTENING, LOW SUGAR BAKED AND FRIED PRODUCTS

Cho C. Tsen, and William J. Hoover, both of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation-in-part of Ser. No. 78,239, Oct. 5, 1970, Pat. No. 3,780,188. This application Nov. 12, 1973, Ser. No. 415,012The portion of the term of this patent subsequent to Dec. 18, 1990, has been disclaimed.
Int. Cl. A21d *2/14, 2/26;* **A23l** *1/16*
U.S. Cl. 426—549 **13 Claims**

1. A composition for preparing wheat flour based, low shortening, low sugar baked or fried products, comprising:
a quantity of wheat flour;
from 0 to 8 percent (baker's weight) of sugar;
from 0 to 6 percent (baker's weight) of shortening;
a quantity of protein supplement sufficient to provide at least about 2¼ percent by weight of additional protein to the baked or fried product and selected from the group consisting of soy flour, soy isolates, nonfat milk solids, whey products, fish protein concentrate, cottonseed flour, chick-pea flour, sesame seed flour, corn-soy-milk blend flour, wheat protein concentrate, wheat gluten, defatted wheat germ, Torula yeast, wheatsoy blend flour, edible single cell proteins, and mixtures thereof; and
from about 0.1 to 3 percent (baker's weight) of an additive selected from the group consisting of the edible alkali and alkaline earth metal salts of the acyl lactylates of C_{16}–C_{18} fatty acids, with the average number of lactylic group in said additive ranging from about 0.5 to 4.

3,883,670

POURABLE CREAM CONCENTRATE

Henricus Jacobus Pennings, Beijerland, Netherlands, and Norbert Herendi, Delmenhorst, Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 7, 1973, Ser. No. 423,372
Int. Cl. A23d *5/00*
U.S. Cl. 426—568 **9 Claims**

1. Pourable cream concentrate comprising by weight: 35–50 percent of fat of a dilatation value at 20°C of at least 200; 0.1–1.5 percent of α-monoglycerides; 1–6 percent of egg yolk; at least 5 percent of sugar, the upper limit being determined by the solubility of the sugar in the aqueous phase; 5–15 percent of polyalcohols selected from the group consisting of glycerol, mannitol and sorbitol; 0–6 percent of vegetable phosphatides; 0–5 percent of egg white; 0–1 percent of stabilizer; the balance being an aqueous phase.

3,883,671

WETTING THE SURFACES OF DOUGH PIECES PRIOR TO FRYING TO ELIMINATE BLISTERING

Mounir A. Shatila, Blackfoot, Idaho, assignor to American Potato Company, San Francisco, Calif.

Filed May 7, 1973, Ser. No. 357,997
Int. Cl. A23l *1/00, 1/12*
U.S. Cl. 426—303 **5 Claims**

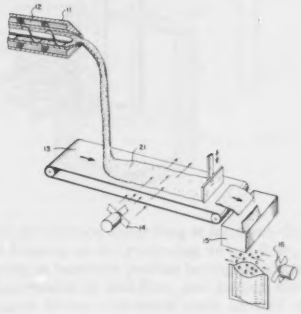
1. A process for the production of a blister-free chip-like snack comprising the steps of:
a. formulating a dough of 25–50% moisture content comprising solids selected from the group consisting of potato, corn, wheat and rice solids and water;
b. forming potato chip sized pieces having a thickness in the range of 0.030–0.045 inch from said dough;
c. moistening the surfaces of said pieces with water;
d. introducing said moistened pieces into hot fat in less than 1 minute following said moistening step before the added surface moisture penetrates appreciably into said formed pieces and deep fat frying said moistened pieces to produce a blister-free potato chip-like snack.

3,883,672

METHOD OF MAKING A DRY TYPE PET FOOD HAVING A MEAT-LIKE TEXTURE AND COMPOSITION THEREOF

David P. Bone, Palatine, and Edward L. Shannon, Barrington, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,888
Int. Cl. A23j *3/00*
U.S. Cl. 426—311 16 Claims



1. A method for the production of a dry pet food containing less than 15 percent moisture by weight and having a soft, elastic, meat-like texture and marbled appearance comprising the steps of:

A. blending a mixture comprising fat, a proteinaceous adhesive, a plasticizing agent, and sufficient water for processing, wherein said proteinaceous adhesive is present in an amount from about 4 to about 60 percent by weight; and said plasticizing agent is present in an amount of from about 2 to about 40 percent by weight,

B. cooking while extruding a mass of said mixture in a non-uniform manner such that a portion of said mass is subject to at least 50 and up to 1,500 more processing units than the remaining portion of said mass, said processing units consisting of the product of seconds X degrees fahrenheit, and

C. cooling the extruded cooked mixture.

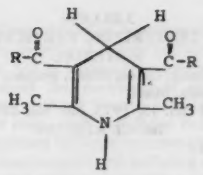
3,883,673

STABILIZATION OF CAROTENE

Solomon Aronovich Giller, ulitsa Pernavas 10, kv. 76; Gunar Yanovich Dubur, ulitsa Suvorova 117, kv. 12, both of Riga; Yan Rikhardovich Uldrikis, ulitsa Darza, 2, kv. 2, Elgava; Gunar Jamovich Tirzit, ulitsa Zhagatu, 22, kv. 33, Riga; Andrei Robertovich Valdman, ulitsa Lenina, 167, Riga; Ivan Markovich Zakharchenko, ulitsa P. Stuckhi, 9/11, kv. 4, Riga; Yazep Yanovich Spruz, ulitsa Lenina, 103, kv. 8, Rezekne; Vitaly Evgenievich Ronis, ulitsa Ermolovoi, 17, kv. 66, Moscow, and Alexandr Andrejevich Makarov, P/o Lugovaya, 3, Moskovskaya Oblast, all of U.S.S.R.

Division of Ser. No. 269,391, July 6, 1972, abandoned, which is a division of Ser. No. 55,288, July 15, 1970, abandoned. This application May 4, 1973, Ser. No. 357,271
Claims priority, application U.S.S.R., July 22, 1969, 135274
Int. Cl. A23l *1/26*
U.S. Cl. 426—311 2 Claims

1. A method of stabilizing carotene contained in fodder products, such as grass flour, comprising treating said fodder products with a 3,5-dicarbonyl derivative of 2,6-dimethyl-1,4-dihydropyridine, conforming to the general formula:



where R is selected from the group consisting of a lower alkyl and an alkoxy, said derivative being taken in the form of a solution in ethanol or in isopropanol or in a vegetable oil in such an amount that the content of the stabilizer in the resulting fodder product is 0.2 g per kg.

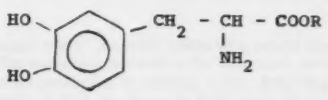
3,883,674

METHOD OF STABILIZING ORGANIC COMPOUNDS AGAINST OXIDATION WITH DOPA OR DOPA DERIVATIVES

Sadayoshi Ninagawa, Yokohama, and Shito Takeshita, Kawasaki, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 17, 1973, Ser. No. 389,205
Claims priority, application Japan, Sept. 1, 1972, 47-87790
Int. Cl. A23d *5/04*
U.S. Cl. 426—544 5 Claims

1. A method of protecting an organic material against oxidation which comprises mixing said material with an antioxidant which is a compound of the formula



or an acid addition salt of said compound,

a. in said formula R being alkyl having 4 to 24 carbon atoms,

b. said material being an oil, fat, or wax of animal, vegetal, or mineral origin and sensitive to oxidation by atmospheric oxygen, and

c. the amount of said antioxidant being sufficient to retard said oxidation.

3,883,675

METHOD FOR PREPARING BLAND CASEINATES

Joanne G. Fujii, Chicago, Ill., assignor to Beatrice Foods Company, Chicago, Ill.

Filed July 28, 1972, Ser. No. 276,168
Int. Cl. N23j *1/20*
U.S. Cl. 426—656 14 Claims

1. A method of producing a bland caseinate comprising preparing a solution of an alkaline earth salt selected from a nitrate, carbonate, sulfate, acetate and halide, heating the solution to a temperature of at least 194°F., adding to the solution with stirring an alkali or alkaline earth caseinate while maintaining said temperature and dissolving the said caseinate, allowing a coagulum to form, separating the coagulum from the mother liquid and washing the coagulum, the caseinate being in the solution in an amount of between 1 and 30 w/w% and the said salt being in the solution in an amount of between 20 and 60 w/w% based on the weight of the caseinate.

3,883,676

METHOD FOR TEXTURIZING PARTICULATE PROTEIN MATERIAL

Palmer K. Strommer, Osseo, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Oct. 18, 1973, Ser. No. 407,750

Int. Cl. A23j 3/00

U.S. Cl. 426—511 8 Claims

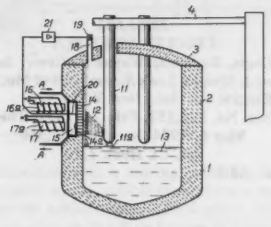
1. In a method for texturizing particulate protein material including feeding the particulate protein material to an elongated pressurized treating chamber, said protein material having a moisture content of between 4 and 40 percent by weight, said chamber having an inlet at one end and an outlet at the other end, said material having sufficient protein content for texturizing, subjecting said particulate material while in said inlet with pressurized fluid from the chamber and subjecting the material to a steam flow from the direction of the inlet into the elongated chamber thereby texturizing said protein material, the steam flow being of sufficient force to propel said material through the elongated chamber and out of the outlet, the pressure in said chamber being at least about 15 p.s.i.g., the steam temperature in said chamber being at least 250°F.; the improvement comprising: the step of cutting said texturized protein material while in said elongated pressurized treating chamber.

3,883,677

ELECTRIC ARC FURNACE HAVING SIDE-WALL LINING PROTECTION

Bertil Hanas, and Jan Marchner, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Apr. 5, 1974, Ser. No. 458,353
Claims priority, application Sweden, Apr. 5, 1973, 7304776
Int. Cl. F27d *1/00*
U.S. Cl. 13—35 **5 Claims**



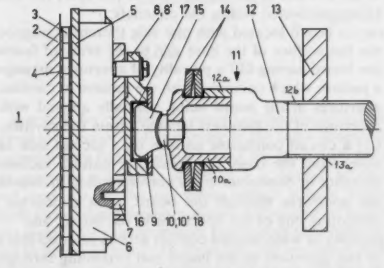
1. An electric arc furnace comprising at least one electrode having an end forming an arc producing an arc flare, a side wall lining having at least one portion having an inside positioned to be bombarded by said flare, said portion having an outside, a magnet having pole-piece ends on said outside forming a magnet flux field traveling through said portion and beyond said inside and on said inside holding ferro-magnetic particles forming a flare shield until the particles are heated to their Curie point temperatures, and a feeder for feeding said field with replacement ferro-magnetic particles at temperatures lower than their Curie point temperatures; wherein the improvement comprises said lining having an outer surface in which a recess is formed at said portion so that said portion has a reduced wall thickness through which said flux field must travel, and means between said magnet and recess for water-cooling said portion of reduced wall thickness.

3,883,678

INDUCTION TYPE CRUCIBLE FURNACE

Fritz Hegewaldt, Herdecke; Hans Werner Mauve, Lunen-Brambauer, and Otto Erdmann, Dortmund, all of Germany, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Mar. 5, 1974, Ser. No. 448,407
Claims priority, application Germany, Mar. 16, 1973, 2313157
Int. Cl. H05b *5/18*
U.S. Cl. 13—27 **4 Claims**



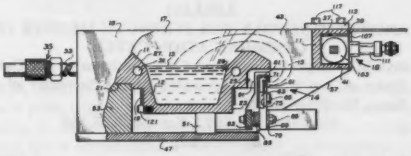
1. In a crucible furnace of the induction type the combination comprising a ceramic melting pot, said melting pot being supported at the inner side of an induction coil, transformer-lamination packets distributed around and in contact with the outer side of said coil in uniformly spaced relation, support plates secured along the periphery of said transformer-lamination packets, a thrust bearing secured at the side of each said support plate, each said thrust bearing being constructed as an electrical insulator and provided with a recess in which a press head engages and including a cover member which surrounds and captures a portion of said press head, and each said press head being constructed as an electrical insulator and disposed at the end of a radially adjustable clamping means threadedly engaged with an upright post forming a component of the mounting base of the furnace.

3,883,679

VAPOR SOURCE ASSEMBLY

Robert L. Shrader, Castro Valley, and Kazumi N. Tsujimoto, El Cerrito, both of Calif., assignors to Airco, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 386,489, Aug. 8, 1973, abandoned. This application May 6, 1974, Ser. No. 466,996
Int. Cl. H01j *37/14*
U.S. Cl. 13—31 **4 Claims**



1. A vapor source assembly comprising means forming a crucible for containing material to be vaporized, an electron beam gun for producing an electron beam, deflecting means for producing at least one magnetic field having lines of force extending transversely of the path of the electron beam to deflect the electron beam through an arcuate path from said electron beam gun to said crucible, said deflecting means including a pair of pole members positioned on opposite sides of said crucible and between which the lines of force of the magnetic field extend, and magnetic shield means positioned between said pole members and said crucible for preventing at least some of the lines of force extending between said pole members from passing through said crucible.

3,883,680

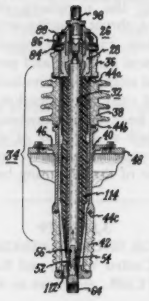
HIGH VOLTAGE ELECTRICAL BUSHING INCORPORATING A CENTRAL CONDUCTOR EXPANDABLE EXPANSION CHAMBER

William A. Keen, Jr., Cheshire, Mass., assignor to General Electric Company

Filed Jan. 18, 1974, Ser. No. 434,386
Int. Cl. H01b *17/26, 17/34*
U.S. Cl. 174—12 BH **15 Claims**

1. An electrical bushing assembly of the type having,
a hollow insulating housing,
an elongated hollow conductor extending through the hollow portion of said hollow insulating housing,
a dielectric fluid inside said hollow insulating housing completely surrounding said elongated hollow conductor, said dielectric fluid having a temperature dependent volume; wherein the improvement comprises:
a. a dielectric fluid-containing chamber, inside said elongated hollow conductor, having at least two fluid barriers, at least one of which is movable to vary the volume of said dielectric fluid-containing chamber; and

b. an opening into said dielectric fluid-containing chamber that allows movement of said dielectric fluid into



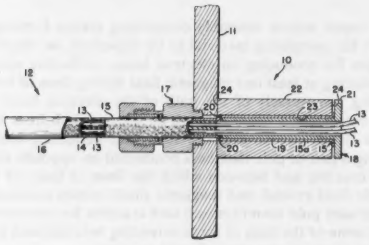
and out of said dielectric fluid-containing chamber in response to thermal expansion and contraction of said dielectric fluid.

3,883,681

ANCHOR ASSEMBLY FOR STRENGTH MEMBER OF COMMUNICATION CABLE

Robyn M. Campbell, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1973, Ser. No. 425,357
Int. Cl. H02g *3/06*
U.S. Cl. 174—65 R **2 Claims**



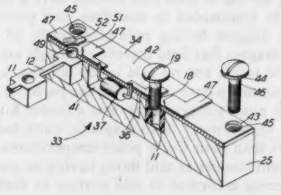
1. A secure mechanical interconnection comprising:
a wall member having an opening therethrough;
a coaxial cable having at least one axially extending conductor of electromagnetic energy, insulation covering said conductor, an elongate braided conductive shielding coaxially disposed about said insulation and an elongate flexible covering coaxially carried on said shielding, said cable extending through said opening in said wall member;
a rigid elongate tubular-shaped member having an inner diameter sized to contain and containing said conductor therethrough and further having an outer diameter sized to fit and fitting within said braided conductive shielding in a slidable relationship, said elongate tubular-shaped member being provided with an annular rounded shoulder at one end and a radially extending rim at its opposite end and;
a rigid cylindrically-shaped member coaxially carried on said rigid elongate tubular-shaped member by having a coaxial bore sized to fit about said tubular-shaped member and said braided conductive shielding, said cylindrically-shaped member being configured with oppositely facing ends for mechanically engaging an inner surface of the wall member and said radially extending rim of said tubular-shaped member, as a tensile force is exerted on said coaxial cable, said braided conductive shielding uniformly gripping said elongate tubular-shaped member along the surfaces defined by said outer diameter and said rounded shoulder and said radially extending rim bearing against one oppositely facing end of said rigid cylindrically-shaped member to transfer the tensile force to the wall member via the other oppositely facing end of said rigid cylindrically-shaped member.

3,883,682

CIRCUIT ASSEMBLY

Albert W. Cagle, Raytown; Wayne E. Greer, Independence, and Wilbur J. Weight, Lee's Summit, all of Mo., assignors to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 228,152, Feb. 22, 1972. This application May 6, 1974, Ser. No. 467,360
Int. Cl. H05k *1/12*
U.S. Cl. 174—68.5 **5 Claims**

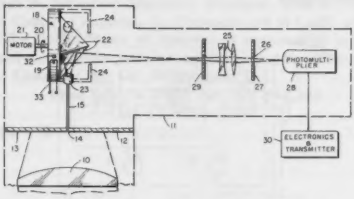


1. A circuit board assembly comprising:
a base having a flat surface, a plurality of cavities located according to a defined pattern in the flat surface, and a plurality of channels located in the plane of the flat surface, each of the channels connecting one of the cavities with at least one other adjacent one of the cavities;
an array of fasteners comprised of a plurality of apertured blocks, and a plurality of runners interconnecting the blocks into a self-supporting structure, the runners positioning the blocks substantially according to the pattern of cavities in the base, each of the blocks occupying one of the cavities in the flat surface of the base, the runners being positioned within the channels;
a circuit board located with one side thereof contiguous to the flat surface of the base and to the array of fasteners, the board having (1) a plurality of apertures arranged in a pattern which coincides with the pattern of cavities, the apertures in the board being coaxially aligned with the apertures of the fasteners located within the cavities, and (2) a circuit conductor pattern on a second side facing away from the base, the conductor pattern including a plurality of conductor pairs corresponding in number to the apertures through the board, each conductor pair straddling one of the apertures in the board; and
a plurality of wide-headed contact screws inserted into each of the apertures in the board and extending through the board into locking engagement with the apertures of the fasteners, the head of each screw adapted to make contact with both conductors of the corresponding pair of conductors for establishing electrical continuity between such pair of conductors.

3,883,683
HIGH SPEED LINE SCANNER

Herman I. Pardes, Wanamassa, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 9, 1963, Ser. No. 294,795
Int. Cl. H04n *7/00*
U.S. Cl. 178—6 **4 Claims**

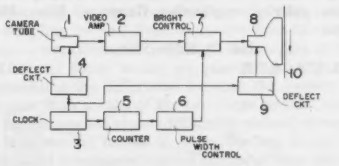


1. In combination with a moving vehicle a line scanning apparatus secured to the vehicle comprising a main imaging lens to image the subject upon a focal plane, a thin flexible fiber optic unit of sheet-like form having its fibers arranged in the same lateral sequence at its input and output ends and operable to transmit one scan line at a time from said focal plane to an arcuate line at its output end, a driven scanner rotating upon an axis at the center of said arcuate line having at least one scanning lens of short focal length fixed on the scanner to move close to the said arcuate end of the fiber optic unit in focus with the ends of the fibers, means to produce timing signals at the beginning and end of each line scanned, a fixed condenser lens, a mirror fixed to the scanner positioned to reflect light passing through the scanner lens to said condensing lens, a fixed aperture plate acting to reduce the reflected light passing the condenser lens to a small area beam, light sensing means receiving said small beam and communication and reproduction means modulated by the output of said sensing means.

3,883,684
SYSTEM FOR RECORDING AN INSTANTANEOUS CONFIGURATION OF MOVING BODIES

Yoshizo Ikegami, Amagasaki, and Kenzo Yamanouchi, Kobey, both of Japan, assignors to Konan Camera Research Institute, Japan

Filed Apr. 6, 1973, Ser. No. 348,602
Claims priority, application Japan, Apr. 10, 1972, 47-36336
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **11 Claims**

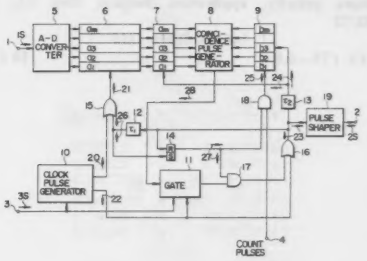


1. A system for obtaining a record of the configuration at a required location of bodies moving in the same general direction, comprising fixed camera means for constantly scanning a line covering a location at which it is desired to obtain a record and for producing video output signals indicative thereof, video signal memory means responsive to said video output signals for synchronously converting said video output signals to photo-signals to be recorded, and recording material means movable in a predetermined direction relative to said video signal memory means, said recording material means being responsive to said photo-signals for producing on the surface thereof a photo-image corresponding to the scene scanned by said camera means, said video signal memory means including line means for producing on the photo-image on the surface of said recording material means lines extending transversely to the direction of movement thereof and being indicative of predetermined intervals of time.

3,883,685
PICTURE SIGNAL CONVERSION SYSTEM

Yasufumi Yumde, and Takashi Furuhata, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed July 17, 1973, Ser. No. 379,950
Claims priority, application Japan, July 19, 1972, 47-72341
Int. Cl. H04n *7/12*
U.S. Cl. 178—6.8 **24 Claims**



1. A signal conversion system for converting a picture signal into a pulse train signal of a low frequency band, comprising:
analog to digital converting means for converting a picture signal into a coded signal by sampling the picture signal;
a digital memory having a capacity capable of storing at least one frame of a picture signal converted into the digital signal, in and from which the digital signal can be written and read by the application of a pulse signal thereto;
means for producing clock pulses having periods equal to the sampling periods by the analog to digital converting means;
a hold circuit for temporarily storing one coded sample value read from the digital memory;
means for producing a reference pulse signal having a predetermined period;
counting means for counting the number of pulses of the reference pulse signal produced by the pulse signal producing means;
a coincidence circuit for producing a coincidence pulse when the coded signal stored in the hold circuit and the coded signal corresponding
to the number counted by the counting means are in agreement with each other;
means for writing the picture signal of one frame coded by the analog to digital converting means, successively, sample value by sample value, in the digital memory by the application thereto of the clock pulses from the clock pulse producing means;
means for producing, upon completion of writing the picture signal of one frame in the digital memory, a pulse to output it as one of the pulses of an output pulse train signal, and to apply it to the digital memory to read one sample value of the stored coded signal therefrom, and for storing the read out one sample value in the hold circuit;
means for supplying the coincidence circuit with the coded signal stored in the hold circuit and the coded signal representative of the number of pulses of the reference pulse signal counted by the counting means to compare them; and
means for providing the coincidence pulse produced by the coincidence circuit as the pulse train signal, for resetting the counting means and the hold circuit by the coinci-

dence pulse, and for applying the coincidence pulse to the digital memory to read therefrom the next one sample value of the stored coded signal which is stored in the hold circuit.

3,883,686

METHOD TO REDUCE THE EFFECT OF A LOSS OF INFORMATION DURING TRANSMISSION COMPRESSED BAND WIDTH AND DEVICE FOR CARRYING OUT THE METHOD

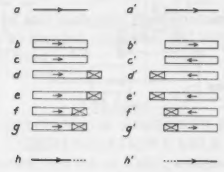
Anton Christian Jacobaeus, and Lars Ake Wern, both of Stockholm, Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sept. 20, 1973, Ser. No. 399,400

Claims priority, application Sweden, Oct. 12, 1972, 13182/72

Int. Cl. H04n *1/38*

U.S. Cl. 178—6.8 **10 Claims**



5. In a system for transmitting TV-pictures, apparatus for transmitting at compressed bandwidth a PCM-signal representing the light intensity of picture elements sequentially scanned in a TV-frame conprising: a coder means for sequentially coding analog light intensity signals to first PCM-words, each PCM-word representing the light intensity of a picture element; storage means for sequentially registering the first PCM-words representing a first set of the picture elements in a first group and for sequentially registering the first PCM-words representing a second set of picture elements in a second group, and for sequentially reading out the first PCM-words of said first group and said second group so that the words of one of the groups are read out in the same order as the first PCM-words are generated by said coder means and the words of the other group are read out in the opposite order; and recoder means receiving the read-out first PCM-words from said storage means for recoding said first PCM-words to second PCM-words representing compressed coded information about the picture elements.

3,883,687

CODED SIGNAL SYNCHRONIZING DEVICE

Claude Stenstrom, Villebon sur Yvette, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel

Filed Sept. 26, 1973, Ser. No. 400,831

Claims priority, application France, Sept. 26, 1972, 72.34053

Int. Cl. H03k *5/00, 13/00*

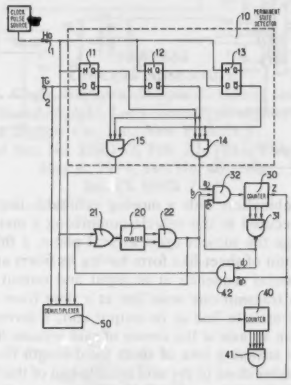
U.S. Cl. 178—69.5 R **9 Claims**

1. A synchronization device for use in the receiving unit of a data transmission system providing signals of first and second levels and operating by division of time into intervals having a fixed duration subdivided into subintervals during which a signal transition between said first and second levels may occur, with coding of the interval in which a transition appears being represented by a word of p bits identifying the order of the subinterval thereof in which the transition occurs and the coding of the interval in which no transition occurs being represented by a first permanent word of p bits for one level and a second permanent word of p bits for a second level, comprising

detector means receiving an uninterrupted sequence of bits for detecting each occurrence of one of said first and second permanent words and providing an output in response thereto,

means providing clock signals synchronized to said sequence of bits,

first counter means responsive to said clock signals for providing a synchronizing output for each count of p clock signals,



second counter means responsive to the outputs of said detector means and said first counter means for counting the number of occurrences of said one of said first and second permanent words in synchronism with said synchronizing output, and

control means responsive to said first and second counter means for advancing the count of said first counter means independently of said clock signals each time the count of said second counter means is less than a prescribed amount within an interval of a given number of synchronizing outputs.

3,883,688

METHOD AND ARRANGEMENT FOR RECORDING BY A WRITING BEAM

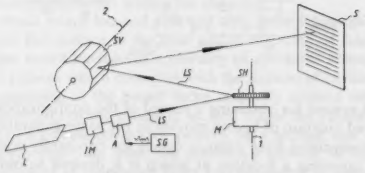
Ulrich Greis, Weyarn, and Josef Helmberger, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 26, 1974, Ser. No. 446,019

Claims priority, application Germany, Mar. 29, 1973, 2315594

Int. Cl. H04n *5/66, 5/84*

U.S. Cl. 178—6.7 R **15 Claims**



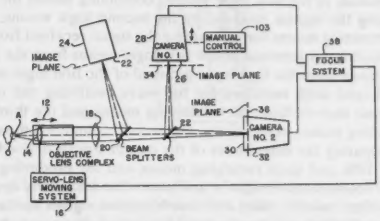
7. An arrangement for line-by-line recording of information by a controlled writing beam comprising means for generating a writing beam; a recording medium spaced from said generating means; means for controlling movement of said writing beam to produce on said recording medium a plurality of substantially parallel recording lines spaced in transverse direction from each other, said controlling means producing in said recording lines transverse deflections forming a repeat-

ing error pattern; and means for superimposing deflections to said beam in accordance with statistical fluctuations to suppress said error pattern.

3,883,689
SERVO-CONTROLLED INTRAVITAL MICROSCOPE SYSTEM

Momtaz N. Mansour; Harold J. Wayland, both of Pasadena, and Carl P. Chapman, La Crescenta, all of Calif., assignors to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Sept. 4, 1973, Ser. No. 394,149
Int. Cl. H04n *5/38*
U.S. Cl. 178—7.2 **7 Claims**



1. Microscope apparatus for viewing a moving area of an object comprising:

lens means positioned behind the object;

lens moving means for moving the lens means;

viewing means positioned behind the lens means;

first and second video camera means positioned behind the lens means for generating video signals, the first camera means positioned slightly behind the image plane of the lens means and the second camera means positioned slightly in front of the image plane of the lens means;

beamsplitter means positioned behind the lens means and in front of the viewing means and the video camera means, to pass light to the viewing means and each camera means;

first and second focus sensor circuits respectively connected to the outputs of the video camera means, each focus circuit including a first electrical filter for passing only predetermined high frequency components of the video signal, low pass filter means for integrating signals representing the high frequency components, and means for coupling the first filter to the low pass filter means;

difference circuit means coupled to the outputs of the first and second focus means for generating a signal value representing the difference between the outputs of the low pass filter means of the two focus circuits; and

servo means coupled to said difference means for energizing the lens moving means to move the lens means with a directional component toward and away from the object.

3,883,690
JUNCTION UNIT ALTERNATIVELY PROVIDING BRANCH LINE BROADCASTING OF DATA AND BRANCH LINE SELECTION

Leo Michael Kolensky, Irvington; Randolph John Pilc, Holmdel; Walter Rudolph Schaefer, Wall Township, Monmouth, and Allan Howard Wiland, Loch Arbour, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 19, 1973, Ser. No. 426,333
Int. Cl. H04h *9/00;* **H04l** *25/20*
U.S. Cl. 178—73 **8 Claims**

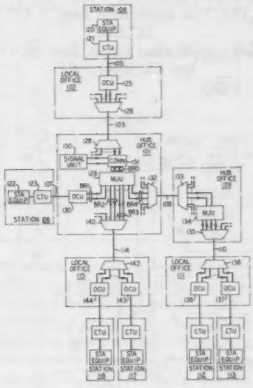
1. A junction unit interconnecting a plurality of two-way branch lines, one of the branch lines extending to control equipment, the junction unit comprising,

means for repeating signals received from each of the branch lines,

means for broadcasting the repeated signals to all of the other branch lines,

means for blocking the repeated signals,

means for distinguishing between the reception of data signals and control signals from each of the branch lines



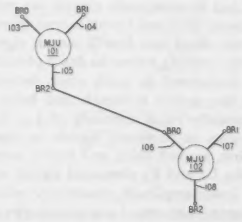
and for enabling the blocking means in response to the reception of control signals, and

means responsive to branch line selection signals received from the branch line extending to the control equipment for disabling the distinguishing means of the selected branch line and of the control branch line and for enabling the blocking means of each unselected branch line whereby the control branch line and the selected branch line are enabled to interchange both data and control signals.

3,883,691
JUNCTION UNIT ALTERNATIVELY PROVIDING BRANCH LINE BROADCASTING AND EXCLUSIVE TWO-BRANCH INTERCONNECTION

Randolph John Pilc, Holmdel, and Gabriel Gary Schlanger, West Orange, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1973, Ser. No. 427,318
Int. Cl. H04h *9/00;* **H04l** *25/20*
U.S. Cl. 178—73 **15 Claims**



1. A junction unit for terminating a plurality of two-way branch lines, the junction unit including signal paths interconnecting an incoming side of each branch line with outgoing sides of all of the other branch lines,

Characterized in that

the junction unit further includes means responsive to con-

current reception of signals from the incoming sides of two of the branch lines for severing signal paths exclusive of the signal paths interconnecting the two branch lines.

3,883,692

DECODER APPARATUS WITH LOGIC CIRCUIT FOR USE WITH A FOUR CHANNEL STEREO

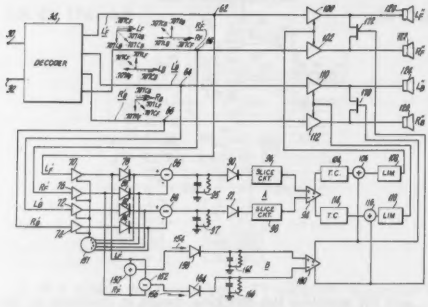
Katsuaki Tsurushima, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 272,439, July 17, 1972, Pat. No. 3,786,193. This application June 7, 1973, Ser. No. 367,886

Claims priority, application Japan, June 16, 1972, 47-60100

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 GQ **8 Claims**



1. Four channel stereo system decoder apparatus for converting first and second composite signals L_T and R_T respectively containing, dominant left-front (L_F) aand right-front (R_F) signal components, each including side-effect left-back (L_B) and right-back (R_B) signal components, if present, and wherein the L_B signal components have substantially equal magnitudes and are in substantially quadrature relationship with each other in the L_T and R_T composite signals and the L_B signal component in one of the L_T and R_T composite signals is in leading relationship with the L_B component in the other of the L_T and R_T composite signals and wherein the R_B signal components have substantially equal magnitudes and are in substantially quadrature relationship with each other in the L_T and R_T composite signals and the R_B signal component in one of the L_T and R_T composite signals is in lagging relationship with the R_B signal component in the other of the L_T and R_T composite signals, into four separate output signals designated as first, second, third and fourth output signals, respectively predominantly containing L_F, R_F, L_B and $R_B$signal components, respectively, the apparatus comprising in combination: a decoding matrix having first and second input terminals to which the L_T and R_T composite signals are respectively applied, first, second, third and fourth output terminals at which the first, second, third and fourth output signals appear; a plurality of phase-shifting networks and a plurality of combining networks connected to each other between the input terminals and the output terminals and being operative to transfer substantially equal amounts of L_F, R_F, L_B and R_B signal components as dominant signals in phase with each other to the first, second, third and fourth output terminals, respectively, the L_F and R_F dominant signals each being accompanied by lower amplitude, quadrature related L_B and R_B signal components with the L_B components accompanying each one of the dominant L_F and R_F signals being in phase opposition to the R_B components accompanying the other of the dominant L_F and R_F signals and the L_B and R_B dominant signals each being accompanied by lower amplitude, quadrature related L_F and R_F signal components with the L_F signal components accompanying each one of the dominant L_B and R_B signals being in phase opposition to the R_F signal components accompanying the other of the L_B and R_B signals; first, second, third and fourth variable transmission means connected to the first, second, third and fourth output terminals, respectively, of the decoding matrix; first logic means having first, second, third and fourth input terminals connected to the first, second, third and fourth output terminals, respectively, of the decoding matrix, the first logic means including first, second, third and fourth rectifiers for full wave rectifying the signals appearing at the first, second, third and fourth input terminals of the first logic means, respectively, first subtracting means for subtracting the second rectified signal from the first rectified signal to produce a first difference signal, second subtracting means for subtracting the fourth rectified signal from the third rectified signal to produce a second difference signal and first comparing means fc. comparing the magnitudes of the first and second difference signals to produce first and second control signals; second logic means having means for receiving the signals applied to the first and second input terminals of the first logic means, combining means for combining the signals received by the second logic means, third subtracting means for subtracting the signal received from the second input terminal of the first logic means from the signal received from the first input terminal of the first logic means, fifth and sixth rectifiers for full wave rectifying the output signals derived from the combining means and the third subtracting means, respectively, and second comparing means for comparing the magnitudes of the output signals derived from the fifth and sixth rectifying means and for producing third and fourth control signals; and means for selectively applying the first, second, third and fourth control signals to the first, second, third and fourth variable transmission means to substantially eliminate crosstalk signal components from the signa.s transmitted by said first, second, third and fourth variable transmission means.

3,883,693

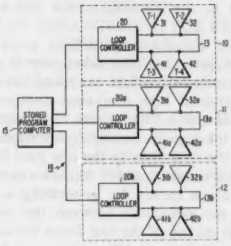
DIGITAL COMMUNICATION SYSTEM

Clarence J. Moore, Philadelphia, Pa., assignor to Applied Information Industries, Moorestown, N.J.

Filed July 11, 1972, Ser. No. 270,649

Int. Cl. H04j *3/08*

U.S. Cl. 179—15 AL **12 Claims**



1. A digital communication system for a plurality of transmitting and receiving terminals connected to a loop signal path, said system comprising the steps of:

transmitting in a certain sequence on said loop path at regular time periods digital messages to be received by said terminals in said sequence and having data words and identifying addresses individually associated with said terminals,

receiving from said loop path digital reply messages transmitted by said terminals,

and storing said reply messages in association with said identifying addresses for subsequent transmitting to said terminals in said sequence,

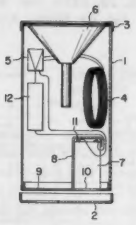
and linking certain terminals for intercommunication including changing the setting of said sequence of terminals that receive said digital messages,

and repeating a substantial number of times for each sequence setting the operational cycle of said transmitting, receiving and storing steps.

3,883,694
LOUD SPEAKER FOR TELEPHONE

Kenichi Watanabe, 4-14-17, Naka-machi, Setagaya-ku, Tokyo, Japan

Filed Apr. 27, 1973, Ser. No. 354,999
Claims priority, application Japan, May 8, 1972, 47-53466; Dec. 23, 1972, 48-618; Dec. 30, 1972, 48-1049
Int. Cl. H04m *1/21*
U.S. Cl. 179—1 HF **2 Claims**



1. A loud-speaker device for use with a telephone comprising a case of non-magnetic material, said case having an axis and two opposite ends extending transverse to said axis so that the case can be rested on either of said ends on a supporting surface in proximity to a telephone receiver which is also rested on said supporting surface, said axis being vertical whichever of said ends is rested on the supporting surface, said case containing a pick-up coil for receiving electromagnetic energy from voice frequency current of the telephone, means for amplifying voice frequency current generated in the coil from said energy, a speaker for transducing the output of said amplifier to audible sound, a source of electrical power connected to the amplifier for making the amplifier operational and a switch included in a connection from the power source to the amplifier for turning the power to the amplifier on or off, said switch being a gravity operated switch which activates the amplifier when the case is rested on one end and deactivates the amplifier when the case is rested on the other end, and in which said speaker is at an end of the case and a cover closes said end, and means on the exterior of said cover for indicating the position of the pick-up coil within the case.

3,883,695
ALARM REPORTING SYSTEM FOR TRANSMITTING DIGITAL ALARM SIGNALS VIA A TELEPHONE LINE

Richard Leroy Bickel, Dallas, and Richard Carroll Osborne, Richardson, both of Tex., assignors to Vertex Science Industries, Inc., Dallas, Tex.

Filed May 14, 1973, Ser. No. 359,723
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 R **9 Claims**

1. An alarm reporting system comprising:

a plurality of sensor consoles each having at least one alarm sensor connected thereto,

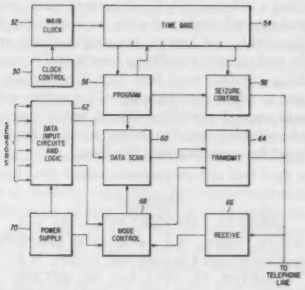
means in each said sensor console for seizing a conventional telephone line in response to the detection of an alarm situation by one of said alarm sensors,

dialing means in said sensor consoles for transmitting digital dialing signals over the seized telephone line,

a central station responsive to the ringing of the dialed telephone line for transmitting over the telephone line to the calling sensor console a digital handshake signal,

transmission means at said calling sensor console responsive to the reception of said handshake signal for transmitting over the telephone line first digital alarm signals representative of the identity of the calling sensor console and of the nature of the alarm situation,

means at said central station for storing said first digital alarm signals and for transmitting another digital handshake signal, whereupon said transmission means transmits a second digital alarm signal over the telephone lines,



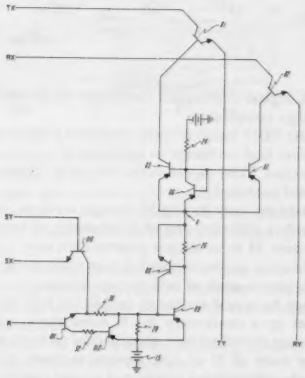
comparator means at said central station for generating an alarm indication if said first and second digital alarm signals match according to predetermined criteria,

means for dialing a second alternate telephone number if the telephone is not answered at said central station, and means for slowing down the transmission of said digital alarm signals via the telephone lines to the alternate telephone station.

3,883,696
SOLID STATE CROSSPOINT SWITCH

Glenn L. Richards, Caledonia, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 232,031, March 6, 1972, Pat. No. 3,789,151. This application Sept. 28, 1973, Ser. No. 401,744. The portion of the term of this patent subsequent to Jan. 29, 1991, has been disclaimed.
Int. Cl. H04q *3/50*
U.S. Cl. 179—18 GF **2 Claims**



1. A solid state crosspoint switch for interconnecting a first and second lead with a third and fourth lead, respectively, comprising:

two semiconductor devices, each having a controllable path poled for conducting current in the same direction through the interconnection and a control terminal for controlling the amount of current flow therethrough, the

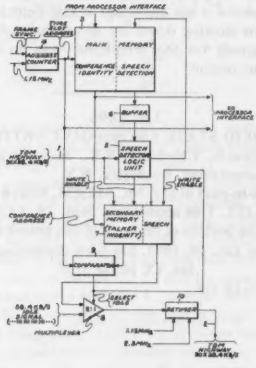
current path of a first one of said devices being connected between the first and third leads, the current path of a second one of said devices being connected between the second and fourth leads; and

control circuit means connected to the control terminals of said first and second semiconductor devices responsive to switching signals for enabling or disabling both current paths thereof simultaneously, said control circuit means including high impedance current regulating means for providing a substantially fixed current when enabling said first and second semiconductor devices, a flip-flop which is set to enable said current regulating means and reset to disable said current regulating means and first and second switching circuits, said first switching circuit being responsive to a first switching signal for setting said flip-flop and said second switching circuit being responsive to a second switching signal in the presence of the first switching signal for resetting said flip-flop.

3,883,697
DIGITAL CONFERENCE CIRCUIT

Colin R. Brown, Nutley, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 18, 1973, Ser. No. 407,686
Int. Cl. H04m *3/56*
U.S. Cl. 179—18 BC **14 Claims**



1. A digital conference circuit for an automatic telephone exchange comprising:

a first TDM (time division multiplex) signal input highway from said exchange to said circuit;

a second TDM signal output highway from said circuit to said exchange;

a main memory having M storage sections each associated with a different one of M channels of said TDM signal, where M is an integer greater than one;

addressing means coupled to said main memory to select in sequence each of said storage sections;

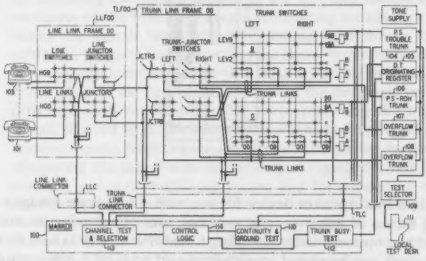
inputs from said exchange coupled to said main memory to set up a conference for N subscribers, said conference being identified by a given digital number which is stored in each of N of said storage sections, each of said N subscribers being connected to said circuit by a different one of N of said channels of said TDM signal, each of said N channels corresponding to a different one of said N of said storage sections, where N is an integer greater than one but less than M; and

detection and storage means coupled to said addressing means, said first and second highways and said main memory, said detection and storage means being responsive to speech from one of said N subscribers in said conference to cause code representations of each speech sample from said one of said N subscribers to be transmitted to the others of said N subscribers in said conference over said second highway in the appropriate ones of said N of said channels of said TDM signal and to transmit a no-signal code to said one of said N subscribers over said second highway in the appropriate one of said N of said channels of said TDM signal.

3,883,698
ARRANGEMENT FOR HANDLING PERMANENT SIGNALS

John Mason Catterall, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 10, 1974, Ser. No. 432,289
Int. Cl. H04m *3/14*
U.S. Cl. 179—18 F **10 Claims**



1. In a telephone system having a plurality of network switching stages interconnected by links for extending communication paths between said stages,

a first group of trunks connected to one of said stages,

a second group of trunks connected to said links,

trunk test means for ascertaining the availability of trunks in said first group,

channel test means for ascertaining the availability of said links, and

control means responsive to the unavailability of trunks in said first group for using said channel test means for selecting an idle one of said second group trunks.

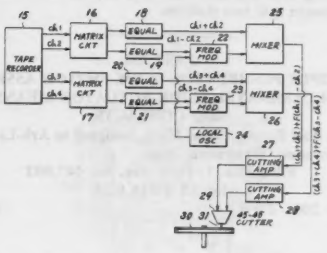
3,883,699
SYSTEM FOR RECORDING AND/OR REPRODUCING FOUR CHANNEL SIGNALS ON A RECORD DISC

Nobuaki Takahashi, Yamato, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Continuation of Ser. No. 92,803, Nov. 25, 1970, Pat. No. 3,686,471. This application June 12, 1972, Ser. No. 261,914
Claims priority, application Japan, Nov. 28, 1969, 44-95587; Mar. 15, 1970, 45-21826; Mar. 24, 1970, 45-24579; July 5, 1970, 45-58313The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.
Int. Cl. G11b *3/00, 3/74;* **H04b** *5/00*
U.S. Cl. 179—100.4 ST **26 Claims**

1. A system for recording four channel signals in a single groove cut on a record disc, said system comprising signal source means for supplying four separate channel signals, matrix circuit means for composing a first sum signal and a first difference signal responsive to the first and second channel signals and also a second sum signal and a second difference signal responsive to the third and fourth channel signals of the four separate channel signals, single oscillator means for generating a carrier wave having a predetermined frequency, first modulator means for angle modulating said carrier wave with the first difference signal, second modulator means for angle modulating said carrier wave with the second difference signal, each of said modulator means comprising means whereby the phase angle deviation of said carrier wave is

between 0.3 and 3 radians, the lower frequency limit of the carrier wave in the output of each of said modulator means being higher than the upper frequency limit of the first and second sum signals, first mixer means for mixing and multiplexing the first sum signal with the output signal of the first modulator means, second mixer means for mixing and multiplexing the second sum signal with the output signal of the second modulator means, and means for simultaneously recording the output signal of said first mixer means on one wall of a single groove of the record disc and recording the output signal of said second mixer means on the other wall of the groove.



3,883,700

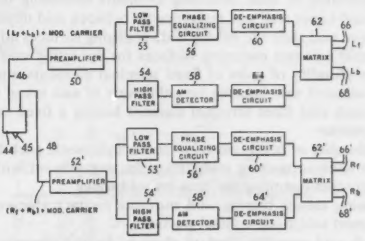
SYSTEM FOR REPRODUCING FOUR CHANNEL SIGNALS RECORDED ON A DISC RECORD

Benjamin B. Bauer, Stamford; Daniel W. Gravereaux, Wilton, and Emil L. Torick, Darien, all of Conn., assignors to CBS Inc., New York, N.Y.

Division of Ser. No. 428,294, Dec. 26, 1973, which is a continuation of Ser. No. 169,219, Aug. 5, 1971, abandoned. This application Apr. 30, 1974, Ser. No. 465,467

Int. Cl. G11b *3/00*

U.S. Cl. 179—100.4 ST **2 Claims**



1. A system for reproducing first, second, third and fourth audio signals which are recorded in a single groove cut on a record disc, wherein a signal representative of the combination of a signal representative of the sum of said first and second audio signals and a single sideband signal with carrier of predetermined frequency modulated by a signal representative of the difference of said first and second audio signals is recorded on one wall of the record groove and a signal representative of the combination of a signal representative of the sum of said third and fourth audio signals and a single sideband with carrier of said predetermined frequency modulated by a signal representative of the difference of said third and fourth audio signals is recorded on the other wall of the record groove, and wherein the lower frequency limit of each of said single sideband with carrier signals is higher than the upper frequency limit of said sum signals, said reproducing system comprising:

pickup means for generating a first electrical signal in response to the signals recorded on the one wall of the groove and for generating a second electrical signal in response to the signals recorded on the other wall of the groove,

first low pass filter means to which said first electrical signal is applied for deriving the signal representative of the sum of said first and second audio signals and first high pass filter means to which said first electrical signal is applied for deriving the single sideband with carrier which is modulated with the signal representative of the difference of said first and second audio signals,

second low pass filter means to which said second electrical signal is applied for deriving the signal representative of the sum of said third and fourth audio signals and second high pass filter means to which said second electrical signal is applied for deriving the single sideband with carrier which is modulated with the signal representative of the difference of said third and fourth audio signals,

first amplitude detector means for demodulating the single sideband with carrier derived by the first high pass filter means to thereby reproduce the signal representative of the difference of said first and second audio signals,

second amplitude detector means for demodulating the modulated carrier wave derived by the second high pass filter means to thereby reproduce the signal representative of the difference of said third and fourth audio signals,

first matrix means responsive to the sum signal derived by said first low pass filter means and the reproduced signal from said first amplitude detector means for separately reproducing the original first and second audio signals, and

second matrix means responsive to the sum signal derived by said second low pass filter means and the reproduced signal from said second amplitude detector means for separately reproducing the original third and fourth audio signals.

3,883,701

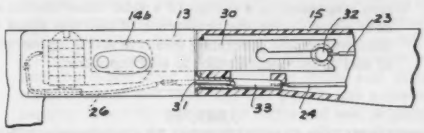
EYEGLASS FRAME WITH HEARING AID

Anthony Delorenzo, 19236 Grand River, Detroit, Mich. 48223

Filed Mar. 18, 1971, Ser. No. 125,480

Int. Cl. G02c *11/06*

U.S. Cl. 179—107 S **2 Claims**



1. The combination comprising

an eyeglass frame front,

a pair of temple tips connected to the frame front,

a pair of electrical lead wires mounted in said frame front, the free ends of said electrical lead wires extending to said temple tips,

a first electric hearing element in one temple,

a second electric hearing element in the other temple,

a first member on said temple tip to which one of said lead wires is connected,

a second member on said temple electrically connected to said hearing element in said temple,

said members having transversely engageable interlocking electrically conductive portions engageable upon relative axial movement of said temple tip and temple toward one another to form a mechanical and electrical connection between said members and the respective temple tip and temple,

and frictionally engageable electrically conductive members on said temple tip and said temple respectively, electrically connected to said other lead wire and said

hearing element in said temple and engageable upon relative axial movement of said temple tip and temple toward one another to provide an electrical connection between said pair of members,

said first member comprising a bifurcated member, said second member comprising a stud engageable by said bifurcated member.

3,883,702

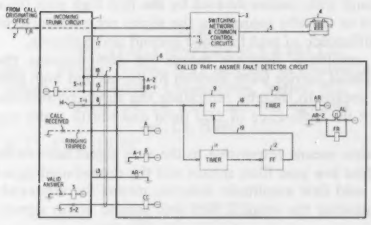
COMMUNICATION PATH FAULT DETECTOR

Alfred Zarouni, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 20, 1974, Ser. No. 471,673

Int. Cl. H04m *3/22*

U.S. Cl. 179—175.3 R **11 Claims**



1. A circuit for use on a communication connection to detect an undesired condition which trips called station ringing and interferes with a called station answer signal needed for call charging and comprising

means responsive to a receipt of a signal signifying a tripping of called station ringing following a receipt of a call for producing a test signal persistent for a prescribed duration,

means activated by said test signal for generating a timed interval an expiration of which indicates an undesired condition that interferes with a valid called station answer signal, and

means responsive to a receipt of a valid called station answer signal during the persistence of said test signal for deactivating said generating means to arrest a generation of said timed interval prior to said expiration.

3,883,703

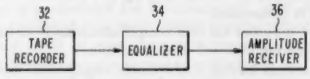
METHOD FOR CONDITIONING TRANSMISSION LINES UTILIZING ADJUSTABLE EQUALIZERS AND A RECORDING TECHNIQUE

Joseph Kenneth Unger, Morristown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 414,964

Int. Cl. H04b *3/46*

U.S. Cl. 179—175.3 R **14 Claims**



1. A method for conditioning a transmission line with an adjustable equalizer device, said transmission line linking two communications stations, said method comprising the steps of:

transmitting a magnetically pre-recorded test signal from one station to the other station over the unequalized transmission line linking said two stations;

recording the received signal on a magnetic storage medium at said other station in response to said test signal;

playing said recorded received signal through said equalizer device off-line;

adjusting said equalizer device for a desired response to said recorded received signal; and

inserting said adjusted equalizer in said transmission line between said two stations.

3,883,704

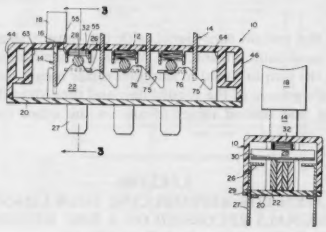
MULTIPLE PUSHBUTTON SLIDE SWITCH ASSEMBLY WITH LAMINATED SLIDE ACTUATOR MEANS FOR ROD CONTACTS

Charles Azel Barney, Stow, Mass., assignor to Ark-Les Switch Corporation, Watertown, Mass.

Filed Mar. 1, 1974, Ser. No. 447,092

Int. Cl. H01h *9/26*

U.S. Cl. 200—5 EB **4 Claims**



1. A multiple pushbutton slide switch comprising

a housing having an upper wall

a set of slides within said housing, each slide having a single camming edge adjacent said upper wall providing actuator camming surfaces and contact camming surfaces thereon

a plurality of slide actuating elements extending through said upper wall and reciprocable between said upper wall and said slide set, having slide engaging surfaces adjacent said actuator camming surfaces for operating said slides

a plurality of pairs of fixed terminal elements mounted adjacent said housing on either side of said set of slides, each said fixed terminal element having a fixed contact portion

a plurality of bodily movable contact elements each having a slide contacting midportion for engagement with said contact camming surfaces on said slides

biasing means biasing said movable contact elements toward said fixed contact portions

each said movable contact element having opposite ends reciprocable in and out of contact with said fixed contact portions of a said pair of fixed terminal elements.

3,883,705

CAM OPERATED, PIVOTED CONTACT SWITCH ASSEMBLY HAVING SPLIT HOUSING AND SAFETY COVER

Robert W. Sebastian, Wheaton; Harry W. Olson, Woodridge, and Thomas F. Silberg, Downers Grove, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jan. 11, 1974, Ser. No. 432,555

Int. Cl. H01h *21/80*

U.S. Cl. 200—6 B **20 Claims**

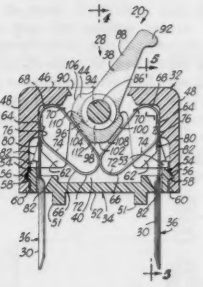
1. A switch assembly comprising:

a housing including a top wall and opposed side walls defining a cavity;

a pair of similar terminals mounted in said cavity, each including a spring contact portion having a base and a loop extending from said base;

said bases being positioned against said opposed side walls and said loops extending toward one another within said cavity, portions of said loops normally abutting one another;

a switch operator pivotally mounted within said cavity for rotational movement between first and second positions



about an axis between said side walls and generally parallel to said side and top walls; and

cam means on said operator engageable with at least one said spring contact portion for separating said contact portions upon pivoting of said operator from said first to said second position.

3,883,706

MULTIPLE ROTARY WAFER TYPE SWITCH WITH AXIAL BRIDGING CONTACTS AND MULTIPLE WAFER CONNECTING RING

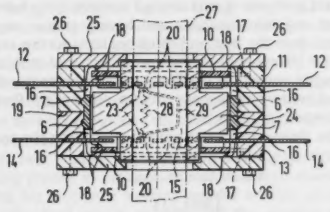
Karl Glaser, Hohlweg 18, 7021, Stetten, Filder, Germany

Filed Dec. 6, 1973, Ser. No. 422,135

Claims priority, application Germany, Dec. 7, 1972, 2260018

Int. Cl. H01h *19/04*

U.S. Cl. 200—11 A **10 Claims**



1. Multiple rotary changeover switch comprising at least two circular insulating members each having a central opening, said members being assembled with end faces thereof being in contact and their openings in registry, radially inwardly extending contact tongues embedded in said insulating members for cooperation with a rotor having contact bridges arranged in said central openings, and an elastically deformable connecting ring disposed in said central openings and axially overlapping said insulating members, and complimentary projections and grooves provided on said connecting ring and insulating members, whereby said connecting ring resiliently engages said insulating members and holds them coaxially towards one another in said assembled relationship.

3,883,707

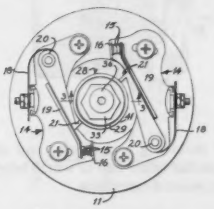
AUTOMOTIVE DISTRIBUTOR CIRCUIT BREAKER WITH ECCENTRICALLY MOUNTED, ROLLER BEARING TYPE CAM

Robert Wenzlaff, Seattle, Wash., assignor to Breakthrough Research & Development Corp., Spokane, Wash.

Filed Jan. 17, 1974, Ser. No. 434,295

Int. Cl. H01h *3/42*

U.S. Cl. 200—30 R **4 Claims**



1. In an ignition distributor of the type mounted on an internal combustion engine and including a distributor drive shaft having an outer end operatively powered by said engine to rotate about a fixed axis, at least one set of normally-closed, spring-loaded contact points mounted to a plate adjacent said distributor drive shaft and having a wiper associated with one of the contact points, said wiper being biased toward the fixed axis, and contact point actuator means mounted to the outer end of the distributor drive shaft for rotation therewith, said contact point actuator means having an exterior surface thereon in engagement with the wiper for operating the wiper in response to rotation of the distributor drive shaft to move the wiper radially with respcet to said fixed axis, thereby opening and closing said contact points, an improvement in said contact point actuator means comprising:

a drive member mounted to the outer end of the distributor drive shaft for rotation therewith about said fixed axis, said member having an eccentric exterior surface centered about an actuator axis parallel to and spaced from said fixed axis;

an actuator member rotatably mounted to the eccentric exterior surface of said drive member for free rotation of said actuator member relative to said drive member about said actuator axis, said actuator member having an exterior surface engaged by said wiper, whereby rotation of said distributor drive shaft serves to rotate said drive member about said fixed axis and permits the actuator member to wobble the exterior surface of said actuator member against the wiper and thereby alternately open and close the contact points without relative sliding movement between said actuator member and said wiper.

3,883,708

TIMER SWITCH ASSEMBLY WITH INDEPENDENTLY CONTROLLED MANUAL AND MOTOR DRIVEN CAMS

Irving Gebel, Skokie, and Michael H. Enger, Schaumburg, both of Ill., assignors to Controls Company of America, Schiller Park, Ill.

Filed Jan. 14, 1974, Ser. No. 432,852

Int. Cl. H01h *43/10*

U.S. Cl. 200—38 R **3 Claims**

1. A timer comprising,

an electric motor including a housing and a drive shaft projecting from and normal to the housing,

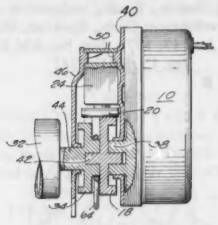
a cam mounted on and driven by the motor drive shaft,

normally open switch means periodically actuated to closed position by said cam as the cam rotates,

a bracket mounted on and parallel to the housing,

a manually operated actuator journaled in the bracket and rotatable between an inoperative position and an opera-

tive position in which it actuates said switch means to closed position and keeps the switch means closed independently of the cam,



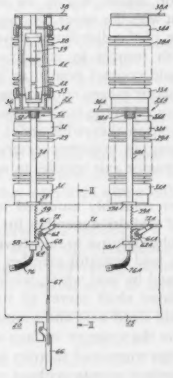
said actuator including a shaft one end of which journals said cam and the other end of which projects through the bracket for manual operation.

3,883,709

VACUUM CAPACITOR SWITCH HAVING GROUNDING SWITCH MEANS

David R. Cole, Tigard, Oreg., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 7, 1973, Ser. No. 422,893
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **3 Claims**



1. In a multiphase vacuum capacitor switch having a supporting base;

a plurality of vacuum interrupters each of which has a pair of separable contacts one of which is stationary and the other of which is movable into and out of engagement with said stationary contact;

a grounding contact associated with each vacuum interrupter, said grounding contact being supported by its associated vacuum interrupter and in electrical conducting relationship with the movable contact of the vacuum interrupter;

a grounded contact rod for each of said vacuum interrupters, said grounded contact rods being carried by said supporting base in position to engage with an associated grounding contact;

operating means connected to said grounding contact rods for effecting the simultaneous movement of said grounding contact rods; and,

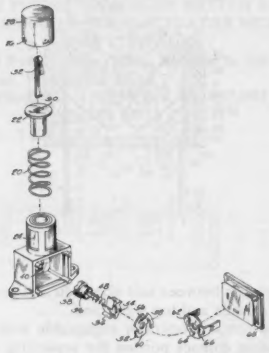
a single actuator connected to said operating means for effecting operation of said operating means.

3,883,710

HEADLIGHT DIMMER SWITCH

Tore B. Hanssen, and Albert F. Ditzig, both of Roselle, Ill., assignors to Controls Company of America, Schiller Park, Ill.

Filed Nov. 14, 1973, Ser. No. 415,837
Int. Cl. H01h *1/56, 13/58*
U.S. Cl. 200—156 **3 Claims**



1. A switch including

a housing,

a plunger mounted in the housing for reciprocal motion and biased outwardly,

an electrically conductive wiper mounted in the housing for rotation in discreet steps and having three equally spaced resilient wiper arms,

three contacts fixed in the housing about the axis of rotation of the wiper for engagement by the wiper arms,

the first and third of said contacts being diametrically opposed with each being in the general shape of a segment of an annulus,

the second of said contacts including two connected diametrically opposed contact portions each having the general shape of a segment of an annulus,

the contact portions of said second contact lying between the first and third contacts and having greater angular embrace than the first and third contacts so the second contact is always engaged by a wiper arm and the next to be engaged contact of the first and third contacts will be engaged before engagement with the other of the first and third contacts is broken,

two of the three wiper arms always contacting the second contact in any at-rest position.

3,883,711

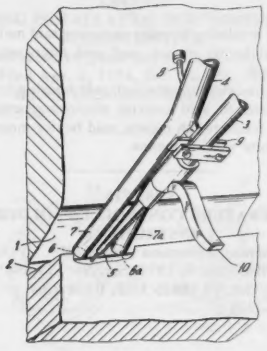
METHOD AND APPARATUS FOR FORMING TRANSVERSE WELDED SEAMS BETWEEN VERTICALLY ORIENTED WORKPIECES

Hans Fischer, Nurnberg, and Herbert Heilendrung, Oberhausen, both of Germany, assignors to Gutehoffnungshutte Sterkrade Akt., Germany

Division of Ser. No. 267,046, June 28, 1972, Pat. No. 3,777,105. This application July 2, 1973, Ser. No. 375,868
Claims priority, application Germany, June 29, 1971, 2132143
Int. Cl. B23k *9/18*
U.S. Cl. 219—73 **2 Claims**

1. Apparatus for forming transversely extending welded seams between facing edges of vertically oriented thick plate sections, by submerged arc welding, in which the upper edge of a lower plate section is formed with a longitudinally extend-

ing V-groove and the facing lower edge of an upper plate section is formed with intersecting bevelled faces extending longitudinally thereof defining a V shape nose with the apex angle of the nose being substantially smaller than the apex angle of the facing groove to provide oppositely facing elongated welding grooves having upper and lower faces sloping upwardly and diverging outwardly of the plate sections, said apparatus comprising, in combination, welding wire feed means operable to guide a welding wire downwardly and laterally inwardly into the welding groove, and including a wire feed nozzle projectable into the groove; means engaging the welding wire fed by the wire feed means to supply welding current thereto; a welding powder feed pipe fixedly connected to said welding wire feed means; said welding powder feed pipe being in the form of a Y-pipe including a downwardly and laterally inwardly extending stem and downwardly diverging leading and trailing legs communicating with said steam and dimensioned to project into the welding groove, and each having a powder discharge opening at its lower end; said



powder discharge openings being arranged before and behind said wire feed nozzle in the direction of movement of said welding apparatus along the welding groove and substantially in alignment with said wire feed nozzle; clamp means secured to said welding powder feed pipe and embracing said welding wire feed means for adjustment of said welding powder feed pipe longitudinally of said welding wire feed means; and means communicating with the stem of said powder feed pipe upstream of the diverging legs thereof and operable to supply a gas under pressure to the welding powder in said pipe; said powder discharge openings being elliptical with the major axes of the ellipses extending in the welding direction and their minor axes being equal to the diameter of the wire feed nozzle; said powder feed pipe being formed of a non-magnetizable metal; said leading leg supplying welding powder into the welding groove in advance of said wire feed nozzle, and said trailing leg supplying welding powder into the groove behind said wire feed nozzle to replenish the welding powder removed by said wire feed nozzle.

3,883,712

INDUCTION HEATING SYSTEM

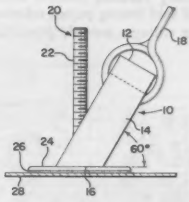
Robert Burke McBriarty, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 1, 1973, Ser. No. 398,718

Int. Cl. H05b *5/08*

U.S. Cl. 219—10.79 **4 Claims**

1. A U-shaped induction heating core for use in activating adhesive in a heat activable adhesive fastener member, such as a stud with an adhesive carrying base extending generally 90° to the axis of the stud, the core including a pair of parallel legs interconnected by a bridge section extending substantially perpendicular to the legs, the bridge section and legs having substantially rectangular cross-sectional configurations with the axes of the bridge and legs lying in in the same plane, the free terminal extremity of each leg forming substantially flat, planar end surfaces which are coplanar with each other, and therefore adapted for intimate contact with the base of a fastener so that flux may be channeled directly through the base without allowing an appreciable amount of flux leakage, the planar end surfaces being disposed at an acute angle to the



plane which includes the axes of the bridge and legs, and therefore presents end surface areas greater than the cross-sectional area of the legs, wherein a magnetic flux path created in the core through the use of a current carrying coil wound thereabout may be minimized thus minimizing the core losses while allowing the flux path to be completed through the base of the fastener member directly beneath the axis of the stud.

3,883,713

FLUX CORED ELECTRODE

Samuil Gurevich, ulitsa Kioto, 9, kv. 89; Vadim Nikolaevich Zamkov, ulitsa Stanislavskogo, 3, kv. 4; Valery Pavlovich Prilutsky, ulitsa Melnikova, 48, kv. 6; Vladimir Filippovich Topolsky, Bulvar Lesi Ukrainki, 3, kv. 2; Nikolai Vasilievich Podkopai, Bulvar Lesi Ukrainki, 2, kv. 8; Semen Leonidovich Dykhno, ulitsa Nkolsko-Botanicheskava, 15/17, kv. 4, and Sergei Afanasievich Manoilo, ulitsa Demuana Bednogo, 12, kv. 33, all of Kiev, U.S.S.R.

Filed Apr. 25, 1973, Ser. No. 354,438

Int. Cl. B23k *35/22*

U.S. Cl. 219—146 **3 Claims**

1. A flux-cored electrode for the fuse welding of metals in a protective atmosphere, comprising: a metal casing made from titanium or its alloys and a flux core which contains in per cent by weight:

calcium fluoride 25–52
magnesium fluoride 45–60
strontium 3–15.

3,883,714

D. C. POWER SUPPLY FOR ARC WELDING WITH SCR CONTROLLING THREE-PHASE POWER

Jasper Lewis James, Rte. 9, Greenville, Tenn. 37743

Filed July 16, 1973, Ser. No. 379,594

Int. Cl. B23k *9/10*

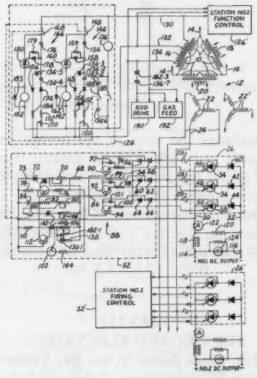
U.S. Cl. 219—131 WR **11 Claims**

1. A D.C. arc welding power supply utilizing three-phase power comprising

a three-phase transformer having primary windings for receiving three-phase power and secondary windings for delivering power in three phases to three respective power conductors,

a three-phase rectifier bridge including three unidirectionally-conductive thyristors each having a power circuit and a gate electrode, with the power circuit serially connected to a respective one of said power conductors and conductive of current unidirectionally upon receipt of a firing signal at the respective gate electrode, and direct current output conductors for receiving said unidirectional current and applying said current to a welding torch,

a timing pulse generator having a reference terminal, an input terminal, and an output terminal, said input terminal being coupled to all of said three power conductors to supply phase reference signals and power to said timing pulse generator, said reference terminal being coupled to one of said output conductors, said timing pulse generator being responsive to said phase reference signals for producing timing pulses on said output terminal following respective phase reference signals, said timing pulse generator including variable control means for controlling the phases of said timing pulses relative to the respective phases of the voltages on said power conductors,



a firing signal generator including a separate amplifying means for each phase, each such amplifying means having an input coupled to said output terminal and being responsive to said timing pulses by generating temporally corresponding firing signals and including means for applying such firing signals to a respective one of said gate electrodes, whereby the current through the respective thyristors is controlled by said control means,

and torch switch means having an off condition and an on condition, said torch switch means being coupled to said timing pulse generator for normally inhibiting said firing signals when in said off condition even though full voltage is applied to said primary windings, and when actuated to said on condition permitting the generation of said firing signals.

3,883,715

CONTROLLED ENVIRONMENT MODULE

Charles Henry Gebo, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,137

Int. Cl. H05b *1/00*

U.S. Cl. 219—210 **10 Claims**

1. A controlled environment module for electronic circuits comprising:

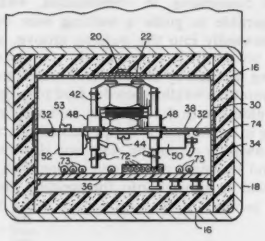
an electrically conductive metallic enclosure;

means for mounting electronic circuits within said metallic enclosure to provide a low impedance path for thermal conduction between the enclosure and the electronic circuits;

coaxial electromagnetic radiation isolating feedthrough means extending through said metallic enclosure for providing electrical connections to the electronic circuits within said metallic enclosure, wherein said metallic enclosure and said coaxial electromagnetic radiation isolating feedthrough means provide an electromagnetic shield for the electronic circuits;

heater means mounted on the exterior of said metallic enclosure for applying heat thereto when energized;

temperature sensing means mounted on the exterior of said metallic enclosure with a low impedance path for thermal conduction between said temperature sensing means and said metallic enclosure;



a thermally insulating housing enclosing said metallic enclosure, said heater means, and said temperature sensing means; and

circuit means extending through said housing for providing connections to said coaxial electromagnetic radiation isolating feedthrough means, said heater means and said temperature sensing means.

3,883,716

TEMPERATURE CONTROLLED SOLDERING INSTRUMENT

William S. Fortune, Panorama City, Calif.

Filed Mar. 8, 1971, Ser. No. 121,808

Int. Cl. H01b *1/02*; **B23k** *3/04*

U.S. Cl. 219—241 **6 Claims**

1. A soldering instrument having an electronic temperature control comprising:

a. a soldering tip;

b. a hollow sleeve connected to said soldering tip;

c. a heater element disposed in said sleeve for heating said tip;

d. a temperature sensor disposed in said sleeve and in close proximity to said tip;

e. a hollow one piece handle having a tapered bore;

f. means for securing said sleeve to said handle;

g. two opposed, longitudinally extending grooves formed in the internal walls of said tapered bore of said handle such

that said grooves converge toward each other from one end of said handle to the other;

h. a circuit board disposed in said grooves of said handle and positioned thereby, said circuit board mounting an electronic control circuit;

i. said electronic control circuit including a potentiometer for setting the desired temperature of said tip;

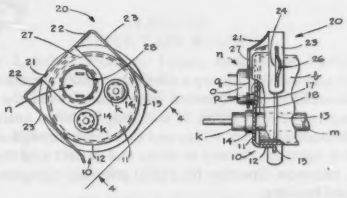
j. said circuit board having a width sized such that when inserted into said handle through the end thereof having the wider groove separation, said circuit board can only be pushed toward the other end to a position such that said potentiometer carried thereby is disposed in alignment with said aperture in said handle; and

k. a rotatable control button disposed in said aperture and having an element thereon disposed for rotation of said potentiometer, whereby rotation of said control button will vary said potentiometer to set the desired temperature.

3,883,717
MOUNTING INSTALLATION FOR TEMPERATURE SENSING SWITCH

Michael J. DelPercio, 16 Quail Run Dr., Imperial, Mo. 63502

Filed Apr. 1, 1974, Ser. No. 456,986
Int. Cl. H05b *1/02*; H01h *37/04*
U.S. Cl. 219—328 **4 Claims**



1. For sensing the temperature of a fluid within and adjacent to an end of a cylindrical member,

a thermoswitch installation including

an end cap sealed to such cylindrical member, and

a thermoswitch external to and having a temperature-sensing face in contact therewith, characterized in that

the thermoswitch temperature-sensing face is planar, and

the end cap has a planar surface indentation of such size as to accommodate said temperature-sensing face of the thermoswitch,

the end cap further having an outstanding flange, in combination with

clip means to mount the thermoswitch to opposed portions of the end cap flange and urge its temperature-sensing face into contact with said planar surface indentation, wherein

the clip means is formed of springy metal and includes

a base portion,

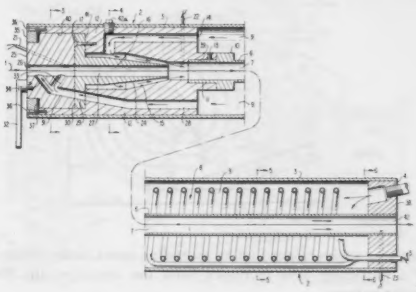
slotted spring-like leg members extending outward therefrom and opposed to each other, the leg members having slots greater in width than the thickness of the cap flange and lying in a common plane, and

a thermoswitch-holding portion extending angularly from the base portion and when mounted being substantially parallel to said planar surface indentation of the end cap, whereby on mounting the thermoswitch in the said holding portion so extending angularly from the base portion, and on mounting the clip means with its slotted leg members embracing opposed portions of the flange of said end cap, the temperature-sensing face will be urged into intimate contact with said planar surface indentation of the end cap.

3,883,718
APPARATUS FOR THERMALLY PROCESSING OF CONTINUOUS LENGTHS OF FIBROUS MATERIALS

George R. Ferment, Dover; Stuart M. French, Chatham, both of N.J., and Paul A. Sessa, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,303
Int. Cl. F27b *9/06*
U.S. Cl. 219—388 **7 Claims**



1. In an apparatus for thermally processing continuous lengths of fibrous materials wherein said fibrous materials are passed through a heating unit to take-up means, said heating unit including,

an elongated cylindrical heat treatment tube having an inlet end and outlet end for the continuous passage therethrough of said fibrous materials to be heat treated,

wherein the improvement comprises:

an elongated cylindrical jacket coaxially surrounding said heat treatment tube for providing an annular chamber about said heat treatment tube;

end closures being positioned in the annular chamber between said cylindrical jacket and said heat treatment tube closing the annular chamber at its ends;

means for introducing a fluid into said annular chamber;

an electric resistance heating coil mounted within the interior of said cylindrical jacket for heating the fluid and promoting the conduction of heat from said annular chamber through said heat treatment tube to heat continuous lengths of fibrous materials passing therethrough;

means connected to the inlet end of said heat treatment tube for introducing heated fluid from said annular chamber into said heat treatment tube to thereby further heat said continuous lengths of fibrous materials passing through said heat treatment tube; and

heat recovery means connected at the outlet end of said cylindrical heat treatment tube for receiving at least a portion of the heat passing through the outlet end of said cylindrical heat treatment tube and for delivering said heat into said annular chamber.

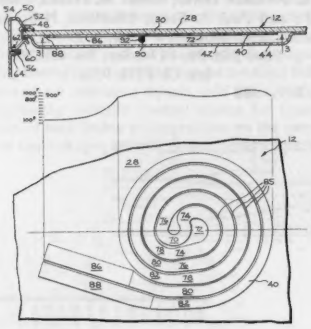
3,883,719
GLASS-CERAMIC COOKTOP WITH FILM HEATERS

Bohdan Hurko, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 10, 1974, Ser. No. 468,753
Int. Cl. H05b *3/68*
U.S. Cl. 219—464 **13 Claims**

1. A solid plate surface heating unit comprising a flat plate having an electrical film heater in winding strip form of generally uniform thickness bonded to the underside thereof, the resistance per unit area of the heated portion of the film heater varying in increasing proportion to the distance of the given area from an imaginary center line of the film heater pattern to give a biased heat distribution toward the outside of the film heater pattern so that the temperature distribution across the top surface of the solid plate is substantially uni-

form, the resistance per unit area at a given distance from the center being substantially constant, while the resistance per



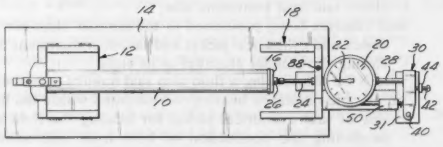
unit area varies in steps on an ascending curve as the distance of a particular area increases from the center of the film heater pattern.

3,883,720

OVEN FOR TESTING OR CALIBRATING PROBE-TYPE THERMOSTATS

Harold F. Snider, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed Dec. 3, 1973, Ser. No. 421,419
Int. Cl. H05b *3/58*
U.S. Cl. 219—535 **20 Claims**



1. An oven for heating a probe-type thermostatic switch, said probe-type thermostatic switch having a switch portion and a cannula portion, said oven comprising in combination:
a. a linearly expansible body defining an oven chamber dimensioned to receive said cannula portion;
b. means for heating the body;
c. means for fixedly supporting the body at one location, the balance of said body being free to move in response to a change in temperature;
d. means for regulating the heat input to said body; and
e. means coacting between a point remote from the fixed location of said body and said heat regulating means to sense linear movement of said point relative to said fixed location as a result of change in temperature and operable to control said heat regulating means.

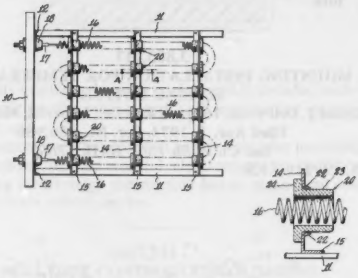
3,883,721

OPEN COIL ELECTRIC HEATER ASSEMBLY

Donald W. Paulson, Esmond, and Dennis J. Harnish, Rockford, both of Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 20, 1974, Ser. No. 452,708
Int. Cl. H05b *3/06*
U.S. Cl. 219—532 **3 Claims**

1. An electric heater assembly for supporting a plurality of reaches of a sinuously formed helical resistance element, comprising:
a heat resistant base,
a thin metal plate secured to said base forming a rigid assembly therewith, said thin plate constituting the sole support for said element reaches adjacent thereto,
said plate having a plurality of apertures therethrough and through which said reaches extend,
said plate at the periphery of said apertures having a serrated configuration to define a plurality of tongues in circumferentially spaced relation extending radially inwardly of said apertures,
said tongues when unstressed being disposed in the plane of said plate,
and a plurality of rigid tubular heat resistant insulating bushings, each having a radial flange thereon, one surrounding each reach where the latter extends through a plate aperture thereby to insulate the reach from said plate,



each said bushing having a diameter slightly greater than the diameter of said aperture measured between the radially innermost extremities of said tongues when unstressed,
each bushing fitting within and extending through a respective aperture thereby to stress and deflect said tongues in a common direction for radial gripping engagement with said bushing,
said bushing radial flange abutting said plate in an axial direction and radially outwardly of said aperture at a point axially spaced from the point of tongue engagement with the bushing,
said spaced axial and radial engagement of said plate with said bushing constituting the sole support of said bushing in said plate, thereby providing an effective, simple and stable support for said electric element reaches in said heater assembly.

3,883,722

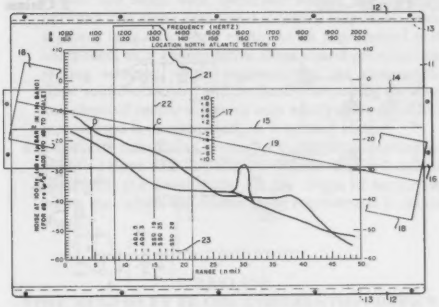
ACTIVE AND PASSIVE SONAR RANGE COMPUTER

Daniel Barron, 15023 Kalmia Dr., Laurel, Md. 20810

Filed June 21, 1973, Ser. No. 371,422
Int. Cl. G06
U.S. Cl. 235—61 B **3 Claims**

1. A hand operated sonar range computer; which comprises, a base,
said base including rails along opposite edges on each side of said base with a spacing between the rail and said base,
a frequency slider secured at the edge of said base and movable along the surface of said base in a line perpendicular to said rails,
a hairline on the center of said frequency slider extending across the length thereof,
a decibel cursor movable across the base for alignment with different values,
a target slider secured in place at its edges by said rails for movement along said base by use of said rails,
a center line across said target slider perpendicular to said hairline on said frequency slider,
graduations on opposite side of said target slider center line representative of different types of sonar equipment, and

a propagation loss insert positioned on said base under said target slider and held in place by said rails,



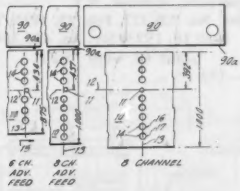
whereby said elements cooperate to determine range in accordance with different parameters of the sea relative to the depth of sonar equipment used.

3,883,723

PAPER TAPE READER

Edward Lukstas, Windsor, Conn., assignor to Varisystems Corporation, Plainview, N.Y.

Filed Nov. 15, 1973, Ser. No. 416,112
Int. Cl. G06k *7/10;* **H04l** *15/18*
U.S. Cl. 235—61.11 E **16 Claims**



1. Guide means for a paper tape reader adapted to accommodate tapes of differing hole patterns and/or tape widths comprising:

first and second spaced parallel tape guide plates for receiving and guiding a punched paper tape therebetween;

a tape reader comprising:

a light source assembly mounted upon said first plate;

a sensor assembly mounted upon said second plate and having a sensor means at each channel position of the tape adapted to generate a pulse when illuminated by the source assembly;

a paper tape guide member rotatably mounted to the input end of one of said guide plates;

said guide member having a plurality of guide slots arranged about the periphery of the guide member, the size and position of each of said slots being adapted to receive a particular punch tape;

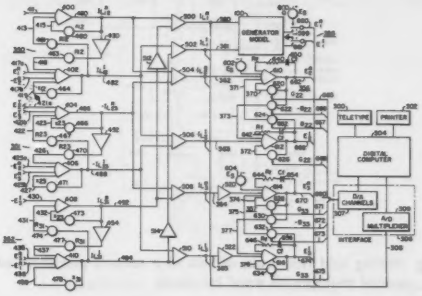
each of said slots being adapted to be selectively positioned into alignment with the guide surface of one of said guide plates to align the channels of the tape passing over the slot with the source and sensor assemblies.

3,883,724

HYBRID ANALYZER FOR FAST LOAD FLOW AND TRANSIENT SOLUTION OF POWER SYSTEMS

Ashok H. Pradhan, and Fred S. Marton, both of Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1973, Ser. No. 396,259
Int. Cl. G06j *3/00;* **G06g** *7/62;* **G06f** *15/56*
U.S. Cl. 235—151.21 **37 Claims**



1. A minimum element DC circuit for representing an electric power system transmission line in accordance with preselected stability criteria and comprising a first circuit for generating an output current signal corresponding to a first coordinate component of at least the series branch equivalent current in the actual system transmission line, said first circuit having as inputs voltage phasor signals representative of first coordinate components of actual voltages at buses to which the transmission line is connected, a second circuit for generating an output current signal corresponding to a second coordinate component of at least the series branch equivalent current in the actual system transmission line, said second circuit having as inputs voltage phasor signals representative of second coordinate components of actual voltages at said buses to which said transmission line is connected, means for representing at least the series branch impedance of the actual transmission line interconnected between said first and second circuits in accordance with said preselected stability criteria allowing for minimum element simulation.

3,883,725

DATA COMPOSITING AND ARRAY CONTROL SYSTEM

J. Robert Fort; James A. Westphal, both of Altadena, and Donald R. Juiles, Chatsworth, all of Calif., assignors to Geophysical Systems Corporation, Pasadena, Calif.

Filed May 7, 1973, Ser. No. 358,078
Int. Cl. G01v *28*
U.S. Cl. 235—151.3 **8 Claims**

1. In a data recording system having a repetitive source, in which on each repetition of said source one or more analog signals are detected, processed and axis-crossing-coded to form pulses which are stored, and said stored pulses are read out at selected digitalizing intervals to form a train of single bit signals, and said trains transmitted to a storage means, the method of recording and compositing said trains of single bit signals compositing the steps of:

a. controlling a magnetic disc means by clock means to run at constant speed, said disc having a plurality of tracks each with a transducing head;

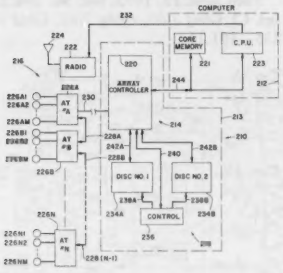
b. responsive to said disc rotation producing said first train of single bit signals;

c. storing in sequence, along said tracks, in a first plurality of single bit spaced locations, each of the bits in said first train;

d. repeating said source and responsive to said disc rotation producing and transmitting to said disc a second train of single bit signals representative of a second record;

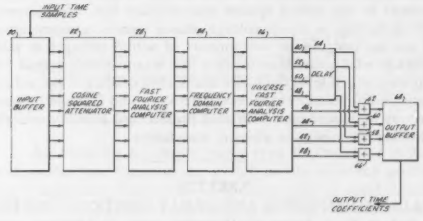
e. reading out from said disc said stored first train of bits in said first single bit locations;

f. storing said second train of single bit signals in said first plurality of spaced single bit locations; and



g. storing said first train of bits in a second pluraliaty of spaced multiple bit word locations.

3,883,726
REDUNDANT FAST FOURIER TRANSFORM DATA HANDLING COMPUTER
Ralph Otto Schmidt, Santa Ana, Calif., assignor to Interstate Electronics Corporation, Anaheim, Calif.
Continuation of Ser. No. 182,685, Sept. 22, 1971, abandoned. This application May 18, 1973, Ser. No. 361,533
Int. Cl. G06f *15/34*
U.S. Cl. 235—152 **8 Claims**



1. A system for transforming input time domain data samples, comprising:

a buffer responsive to said input time domain samples for combining said input time domain samples into data sets, selected ones of said input time domain samples being combined into more than one data set;

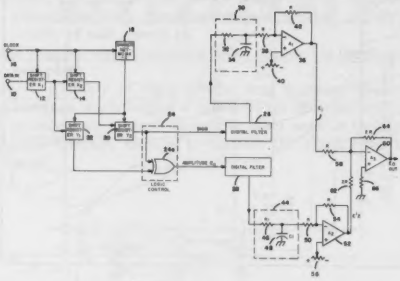
an attenuator responsive to said data sets produced in said buffer for attenuating certain of said input time domain samples of said data sets to produce attenuated output data sets;

a first computer receiving said attenuated output data sets for performing calculations on said output data sets according to the Cooley-Tukey fast Fourier transform algorithm to produce frequency domain coefficients;

a second computer coupled to said first computer for performing calculations on said frequency domain coefficients according to the reverse Cooley-Tukey fast Fourier transform algorithm to produce time domain coefficients; and

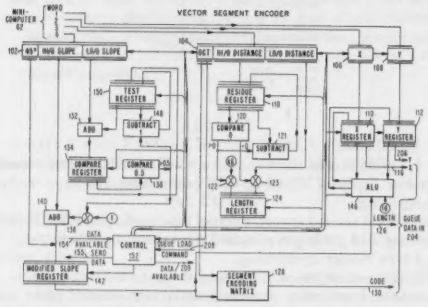
means responsive to said second computer for combining said coefficients to remove from said coefficients the effects of said attenuator.

3,883,727
MULTILEVEL DIGITAL FILTER
Richard L. Stuart, and Arvind M. Bhopale, both of Belts, Md.
Filed July 5, 1972, Ser. No. 269,048
Int. Cl. G06f *1/02, 15/34*
U.S. Cl. 235—152 **5 Claims**



1. A four-level digital filter system for data modems comprising means for converting the incoming data input into first and second parallel inputs, logic control means connected to said inputs for converting said inputs into a sign bit output and an amplitude bit output, first and second digital shaping filters connected to the said outputs for shaping each said output into the inverse Fourier transform of the time response of a substantially ideal low-pass filter, means for adding a bias term to the outputs of one of said digital shaping filters so as to produce a modified output, and summing means for summing said modified output with the output of the other of said digital filters to produce a four-level signal.

3,883,728
DIGITAL VECTOR GENERATOR
Alfred A. Schwartz, Gaithersburg, Md., and Joseph R. Stewart, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 335,377, Feb. 23, 1973. This application Nov. 15, 1973, Ser. No. 416,330
Int. Cl. G06f *15/20*
U.S. Cl. 235—152 **6 Claims**



6. An encoding means for accepting data from a data processor describing the origin, slope and length of a vector to be represented, decomposing said vector into a connected sequence of vector segments, and encoding said segments as vector segment words containing coordinate, length and symbol code data comprising:

a register means for accepting from said data processor, slope, octant, length and coordinate data for the vector to be represented;

a vector length residue means for accepting from said register means said vector length data, cyclically reducing said vector length by subtracting a standard subvector length,

cyclically storing said reduced vector length as a residue length, cyclically testing said residue length and cyclically outputting a length for a subvector into which said vector to be represented is decomposed;

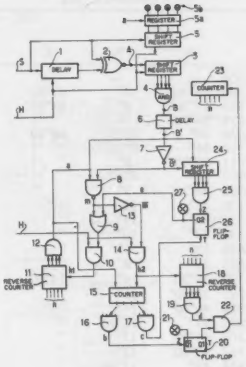
a slope modification means for accepting from said register means said slope data, cyclically adding the difference between said slope data and a standard slope for a vector segment into which said vector to be represented is decomposed, as a cummulative slope round-off error, correcting selected vector segments for the cummulative slope round-off error, and cyclically outputting the modified slope of vector segments into which said vector to be represented is decomposed, as a symbol code;

a coordinate calculating means for cyclically accepting said modified slope data and said coordinate data and cylically generating the coordinates for the origin of vector segments into which the vector to be represented is decomposed.

3,883,729
TIME MULTIPLEX FRAME CORRELATION DEVICE

Francois Augier de Cremiers, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Feb. 12, 1974, Ser. No. 441,738
Claims priority, application France, Feb. 12, 1973, 73.04906
Int. Cl. G06f *15/34*
U.S. Cl. 235—181 **10 Claims**



1. Device for the automatic search for the characteristic data elements of a time multiplexing frame having an unknown number N of bits and at least one repetitive word comprising clock means providing clock signals at the frequency of the bits in said time multiplexing frame, a delay circuit having a variable delay of *n* clock signals, a correlation circuit receiving directly at a first input successive bits of successive frames and at a second input said successive bits via said delay circuit, a detection circuit means for detecting *s* successive coincidences between the successive bits and the delayed bits, and control means for varying the delay of said delay circuit until *s* successive coincidences are detected for which the number N of bits in the frame is equal to the number *n* of clock signals.

3,883,730
ILLUMINATED DECORATIVE DISPLAY

Robert A. Dickson, 33A Knowles Ave., Daly City, Calif. 94014

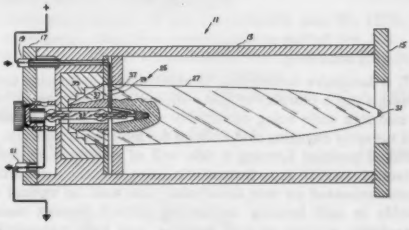
Filed Sept. 13, 1973, Ser. No. 396,942
Int. Cl. F21l *1/00*
U.S. Cl. 240—10.6 R **1 Claim**

1. An illuminated display device comprising: a rectangular battery case, a self-supporting electrically conductive wire extending upwardly from said battery case, a bulb supported over said base solely by said wire in electrical communication therewith, and a light transmitting flexible plastic elliptical sleeve press-fitted on the four vertical edges of said battery case to enclose the case, wire, and bulb while being spaced apart from said wire and bulb, said bulb positioned to transmit light through substantially the entire surface of said sleeve including that portion enclosing said battery case.

3,883,731
LIGHT SOURCE WITH HIGH EFFICIENCY LIGHT COLLECTION MEANS

Harvey L. Morton, Lafayette, and Bradley H. Oland, Oakland, both of Calif., assignors to Tinsley Laboratories, Inc., Berkeley, Calif.

Division of Ser. No. 388,376, March 5, 1973, Pat. No. 3,825,741. This application Apr. 26, 1974, Ser. No. 464,547
Int. Cl. F21v *7/04*
U.S. Cl. 240—41.38 R **2 Claims**



1. A reflector for an axial light source comprising,

a conical light transmissive body having a first index of refraction, said conical body having an axially extending aperture therethrough for accommodating a coaxially extending light source, an apex end and an output end opposite the apex end, and a conical surface inclined with respect to a coaxially extending light source at an angle for forwardly reflecting light rays directed thereon;

reflector means surrounding said conical surface and spaced therefrom for reflecting light escaping from said conical body back into said body; and

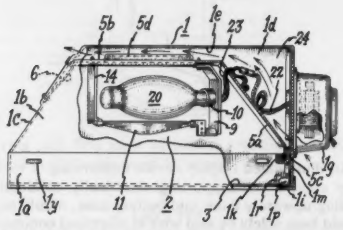
a medium having a second index of refraction greater than the first index of refraction within the space between said

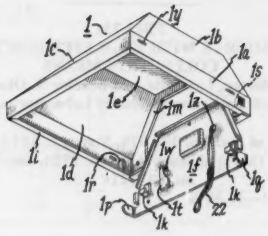
conical body and said reflector means, said medium surrounding the conical body and being in interface therewith.

3,883,732
CEILING LUMINAIRE

David D. Peterson, 74 Lantern Ln., North Kingstown, R.I. 92852, and James L. Grindle, 404 Overlook Ter., Hendersonville, N.C.

Continuation of Ser. No. 311,455, Dec. 4, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,271
Int. Cl. F21v *21/04*
U.S. Cl. 240—73 BC **15 Claims**





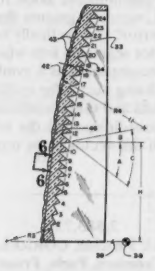
7. A luminaire comprising, in combination, a housing comprising a top, a plurality of side walls and an open bottom, one of said side walls being detachably mounted on said housing and turnably engaging said housing for movement between an installed position forming a side wall of said housing and a detached position away from said housing, electrical operating means mounted on said detachable side wall, an optical assembly in said housing comprising optical support means detachably secured to said housing, and light transmitting cover means removably closing the open bottom of said housing.

13. A luminaire comprising, in combination, a housing comprising a top, a plurality of side walls and an open bottom, one of said side walls being detachably mounted on said housing, electrical operating means mounted on said detachable side wall, an optical assembly in said housing comprising optical support means, and a reflector and lamp holder means secured to said optical support means, said optical support means being detachably secured to said housing for movement of said optical assembly as a unit selectively into and out of said housing through the open bottom thereof, and light transmitting cover means removably closing the open bottom of said housing.

3,883,733
OPTICAL CONSTRUCTION OF A LENS

Robert I. Nagel, Skokie, Ill., assignor to John Voevodsky, Portola Valley, Calif.

Filed Mar. 18, 1974, Ser. No. 451,767
Int. Cl. F21v *5/04*
U.S. Cl. 240—106.1 **4 Claims**



1. An optical lens comprising at least one thin wall section of a spherical shell,

a plurality of similar coterminous aspheric convex lenses on the convex side of said shell,

a plurality of concentric lenses having triangular cross sections on the concave side of said shell having vertices at radii H describing an angle C as given in the following table where angles A and B and the dimension D are as indicated by reference to the accompanying drawings:

TABLE I

No.	H	A	B	C	D
1	.000	—	—	—	.051
2	.220	63°304	4°	67°30′	.062
3	.346	57°30′	4°	61°30′	.080
4	.478	54°30′	7°	" "	.086
5	.620	30°	10°30′	40°30′	.125
6	.716	31°	9°30′	" "	"
7	.811	32°30′	8°	" "	"
8	.907	34°	6°30′	" "	"
9	1.002	35°30′	5°	" "	"
10	1.120	35°	12°	47°	"
11	1.232	36°	11°	""	
12	1.344	37°	10°	"	"
13	1.456	38°	9°	"	"
14	1.568	39°	8°	"	"
15	1.700	38°30′	16°	54°30′	"
16	1.827	39°30′	15°	"	"
17	1.955	40°30′	14°	"	"
18	2.082	41°	13°30′	"	"
19	2.209	41°30′	13°	"	"
20	2.337	42°30′	12°	"	"
21	2.463	43°	11°30′	"	"
22	2.591	43°30′	11°	"	"
23	2.718	44°30′	10°	"	"
24	2.846	45°30′	9°	"	".

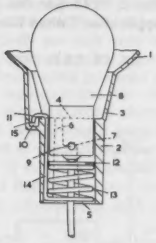
3,883,734
BULBHOLDERS

John Richard Lincoln Joiner, Sutton Coldfield, and Alan John Covel, Solihull, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Filed Dec. 12, 1973, Ser. No. 424,002
Claims priority, application United Kingdom, Dec. 12, 1972, 57180/72
Int. Cl. H01r *13/16*
U.S. Cl. 240—143 **7 Claims**

1. A bulbholder comprising a tubular body open at both ends, opposed recesses and shoulders in said body for receiving, in bayonet fashion, a bulb when passed into said body via one of the open ends thereof, said tubular body being inter-

nally tapered inwardly towards said one of the open ends, a compression spring disposed in said body and arranged to urge said bulb, in use, against said shoulders, and an extension of



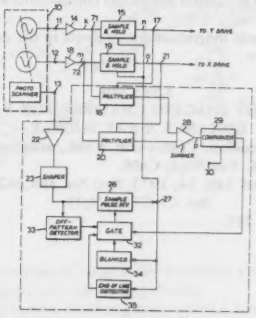
said compression spring engaging the body so as to prevent said compression spring from passing through the other open end of said body.

3,883,735

LINE TRACER

Francis P. Murphy, Hamilton, Ontario, and Robert E. Parker, Dundas, Ontario, both of Canada, assignors to Westinghouse Canada Limited, Hamilton, Ontario, Canada

Filed Dec. 26, 1973, Ser. No. 430,916
Int. Cl. G05b *1/00*
U.S. Cl. 250—202 **6 Claims**



1. A circular scanning line tracer including optical means to scan an illuminated pattern and produce a train of pulses in accordance with the front and rear crossing of the line by the scan, a pair of sinusoidal reference signals phase related to the rotational position of the scan, means comprising gating means for selecting from said train of pulses those pulses indicative of the front crossing of the line by the scan, means to utilize the pulses so selected to sample said sinusoidal reference signals and produce co-ordinate signals representative of the direction of the line relative to the rotational position of the scan, means to combine said coordinate signals with said sinusoidal signals to produce a directional sinusoid of constant amplitude with phase representative of the direction of the line and means to derive from said directional sinusoid, a gating signal to control said gating means.

3,883,736

REMOTE CONTROL UNIT

William S. Liddell, 612 W. Las Palmas Dr., Fullerton, Calif. 92635

Filed Jan. 14, 1974, Ser. No. 433,231
Int. Cl. G06m *7/00*
U.S. Cl. 250—221 **7 Claims**

1. A remote control unit for rotating a controlled device of the type including a rotary selector and shaft comprising:

an activator on said device including a source of radiated signal to direct a radiated signal along a selected path and first sensing means for sensing signals reflected back from said path;

a signal unit remote from said device and including directional reflecting means for positioning in said path to intercept said radiated signal and reflecting it back to said first sensing means;

mask means on said signal unit for normally blocking said selected path to said reflecting means;

mounting means mounting said mask means from said signal unit for shifting thereof from its closed position confronting said reflecting means to an open position opening said path to said reflecting means;

actuating means on said signal unit and coupled with said mask to normally maintain said mask in its closed position and operable upon actuation thereof to shift said mask to its open position; and

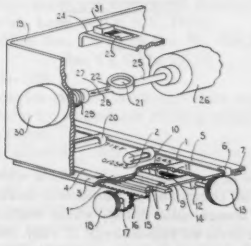
control means connected to said sensing means for rotating said selector shaft and operative in response to registration on said sensing means of said reflected signal to rotate said rotary selector shaft.

3,883,737

CIRCUITS FOR THE GENERATION OF CLOCK PULSES FOR USE WITH A SCANNING DEVICE

Walter Robert Throssell, Hitchin, and Paul Raymond Fryer, Stevenage, both of England, assignors to International Computers Limited, London, England

Continuation-in-part of Ser. No. 219,468, Jan. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 190,729, Oct. 20, 1971, abandoned. This application July 20, 1973, Ser. No. 380,955
Claims priority, application United Kingdom, July 1, 1971, 30849/71; Nov. 25, 1971, 54691/71
Int. Cl. G06k *9/12*
U.S. Cl. 250—235 **2 Claims**



1. Scan control apparatus for generating timing signals, including;

means for repeatedly scanning in sequence a succession of adjacent areas of similar extent, the scanning means comprising:

a static photosensitive device;

an optical imaging system positioned between the photosensitive device and the areas to be scanned; and

means for oscillating the optical system at a nonuniform velocity to image successive ones of the areas on to the photosensitive device as the system moves during each half-cycle of oscillation;

velocity sensing means coupled to the scanning means and responsive to movement of the optical system to produce a velocity signal having a magnitude varying in accordance with the variation in velocity of the system and a polarity dependent on the direction of movement of the system during each successive half-cycle of oscillation;

means for generating a succession of timing signals; and

circuit means associated with the timing signal generator responsive to the velocity signal to control the generation of each of the successive timing signals to occur respectively in synchronism with the scanning of the successive adjacent areas and responsive to said polarity to render effective only those parts of the velocity signal produced during alternate half-cycles of oscillation to inhibit the generation of timing signals except during movement in a predetermined direction.

3,883,738

METHODS OF ANALYSIS OF RADIOACTIVE MATERIAL SEPARATED INTO SOLID AND LIQUID PHASES

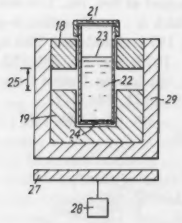
John Stuart Glover, and Bryan Peter Shepherd, both of Amersham, England, assignors to The Radiochemical Centre Limited, England

Filed Dec. 8, 1972, Ser. No. 313,263

Claims priority, application United Kingdom, Dec. 16, 1971, 58566/71

Int. Cl. G21h *1/00*

U.S. Cl. 250—303 **3 Claims**



1. A method of performing an analysis in which a radioactive element or compound is partitioned between a liquid phase and a denser solid phase, which method comprises measuring the level of radioactivity of only one of the two phases while that phase is in contact with the other phase, wherein the measuring device is collimated and screened so as to measure the radioactivity of substantially the whole of the liquid phase but not of the solid phase.

3,883,739

METHOD FOR THE QUALITATIVE AND QUANTITATIVE DETECTION OF VAPOURS FROM LOW VOLATILITY COMPOUNDS

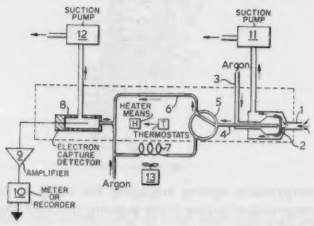
Anthony Jenkins, 54 Finchams Close, Linton, Cambridge, England

Filed May 2, 1973, Ser. No. 356,286

Claims priority, application United Kingdom, Feb. 2, 1973, 5285/73

Int. Cl. G01b *1/18*

U.S. Cl. 250—304 **20 Claims**



1. A method of detecting and identifying components in an atmosphere, comprising the steps of:

isolating present components of interest from the atmosphere and conveying a direct continuous flow of the isolated components to a detector;

detecting the presence of the isolated components in the detector to thereby establish that the detected components are present in the atmosphere;

thereafter continuing a flow of isolated components;

separating said components of the continued isolated flow from each other;

flowing such separated individual components to the detector; and

identifying said individual components in the detector.

3,883,740

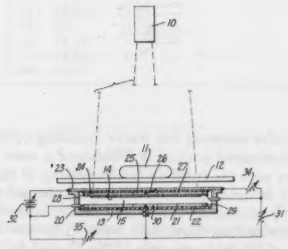
IONOGRAPHY IMAGING CHAMBER FOR VARIABLE DISTANCE X-RAY SOURCE

Andrew P. Proudian, Chatsworth, Calif., assignor to Xonics, Incorporated, Van Nuys, Calif.

Filed Aug. 14, 1973, Ser. No. 388,262

Int. Cl. G03b *41/16*

U.S. Cl. 250—315 **9 Claims**



1. In an imaging chamber for an X-ray system having first and second substantially planar electrodes of low conductivity material,

means for mounting said electrodes in the chamber in spaced relation defining a gap therebetween for an imaging medium responsive to incoming radiation,

means for connecting a power supply to the center of said first electrode and to the periphery of said second electrode, and

a first resistance connected between the periphery of said first electrode and the center of said second electrode completing a current path across the power supply to produce an electrostatic field in the gap,

with the conductivity per unit area of each of said electrodes varying from a central zone to said peripheries such that the electrostatic potential at the gap surfaces of the electrodes approximates the electrostatic potential for concentric spherical metal electrodes,

the improvement comprising a second resistance electrically connected in parallel between the center and periphery of one of said electrodes for producing different currents in said first and second electrodes and thereby compensate for movement of an X-ray source relative to said chamber.

3,883,741

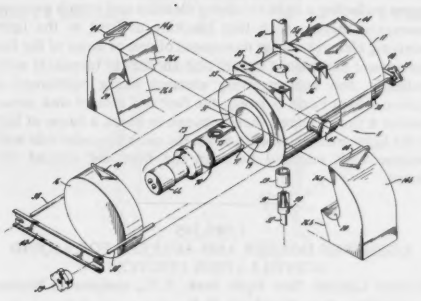
SCINTILLATION COUNTER, MAXIMUM GAMMA ASPECT

Arnold David Thumim, Chicago, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed July 27, 1973, Ser. No. 383,085

Int. Cl. G01t *7/08*

U.S. Cl. 250—328 **3 Claims**



1. In a scintillation counter for detecting and measuring the gamma activity of a sample, including

a vertical sample receiving zone within a massive lead radiation shield,

a scintillator crystal in gamma-transmissive relation with said sample receiving zone,

at least one photomultiplier tube in light-transmissive relation with said scintillator crystal,

a vertical bore extending upwardly through said shield to said sample receiving zone, and

an elevator in said vertical bore for transferring said sample into and out of said sample receiving zone,

the improvement whereby the gamma detecting efficiency of said counter is maximized, comprising:

a sample receiving zone substantially longer than said sample, and

an upstanding elevator extension platform having a plurality of thin vertical sample-supporting members to position said sample above the bottom of the sample receiving zone, so that transversely-emitted gamma radiation leaving the bottom of said sample is permitted to reach said scintillator crystal.

3,883,742

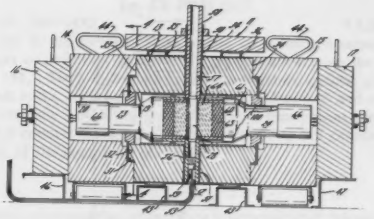
SCINTILLATION COUNTER, SEGMENTED SHIELD

Robert E. Olson, Glen Ellyn, and Arnold David Thumim, Chicago, both of Ill., assignors to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed July 27, 1973, Ser. No. 383,097

Int. Cl. G01t *7/08*

U.S. Cl. 250—328 **5 Claims**



1. In a scintillation counter having

a sample-receiving zone within a massive lead radiation shield,

at least one photomultiplier tube assembly responsive to light scintillations produced from radiation emitted by said sample, said tube having an elongated shape and being removably contained within said shield,

the improvement whereby said lead radiation shield is disassembleable into a plurality of segments to allow installation and removal of said photomultiplier tube, and which segments, when assembled, prevent straight-line access of external radiation through said lead shield into said sample-receiving zone or into said assembly, comprising:

a sample-zone-surrounding segment having an axial cylindrical bore sufficiently large in diameter to receive one section of said elongated photomultiplier tube assembly, an intermediate segment having an axial cylindrical bore coaxial with said sample-zone-surrounding segment for receiving a second section of said photomultiplier tube assembly, said intermediate segment being longitudinally divided into two segments for radial outward movement of each segment to permit access to said second photomultiplier tube assembly section, and

an end cap segment covering the bore of said intermediate segment, the parting surfaces of said segments thereby having no surfaces offering straight-line access of external radiation through said lead shield into said sample-receiving zone or into said assembly.

3,883,743

FILM NEGATIVE DISPLAY SYSTEM

Rudolf J. Hradcovsky, and Adriena M. Hradcovsky, both of 27 W. Beech St., Long Beach, N.Y. 11561

Filed Dec. 13, 1973, Ser. No. 424,207

Int. Cl. G01n *21/34*

U.S. Cl. 250—329 **16 Claims**

1. A system for viewing black-and-white negatives in positive image form for subsequent printing comprising

a support frame;

a housing adjustably mounted on said support frame for movement therealong;

a white light source mounted in said housing for projecting light in a predetermined path;

a condensor mounted in said housing in said path;

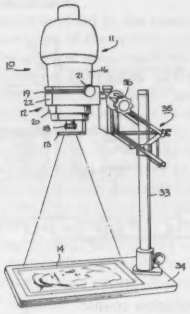
a lens system mounted on said housing in said path for passage of the light therethrough;

a negative mounting means removably mounted in said housing upstream of said lens system relative to said white light source and in said path;

an infra-red filter mounted on said housing for movement into and out of said path downstream of said lens relative to said white light source lens;

an ultra-violet light source for projecting ultra-violet light; and

a plate mounted in said path in spaced relation to said housing for visual viewing, said plate having a luminescent coating thereon to receive ultra-violet light from said ultra-violet light source for activation of said coating and to receive infra-red light from said white light source through said filter for quenching the received ultra-violet light on said plate whereby upon mounting of a black-and-white negative in said negative mounting means and activation of said light sources, a positive reverse image of the negative appears on said plate for viewing.



3,883,744

MACHINES FOR EXAMINING PNEUMATIC TIRES

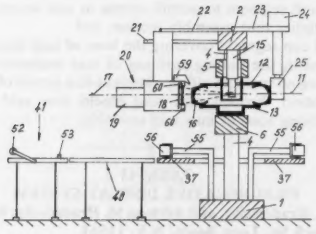
Horst Steffel, Fischerweg 2, 24 Lubeck-Gothmund, Germany

Filed Nov. 13, 1972, Ser. No. 305,910

Claims priority, application Germany, Nov. 23, 1971, 2157964

Int. Cl. G03b *41/16*

U.S. Cl. 250—360 **3 Claims**



1. A tire-examining device comprising in combination: first disk means having a first circumscribing flat lower face extending in a first plane, and for rotation of said first face along said first plane around a first central axis structure extending transversely of the first disk means; a first shaft means rotatably mounting said first disk means for said first rotation; second disk means having a second circumscribing flat upper face extending in a second plane substantially parallel to the first plane with second central axis structure extending transversely to the second disk means and substantially coaxially with said first axis strcture; the flat lower face and the flat upper face each being of predetermined diameter greater than diameters of annular beads of a tire to be mounted therebetween such that in opposing relationship the flat lower face and the flat upper face are gripable in vise manner against opposite side faces of a tire mounted for inspection; plate moving axially one of the first disk means and the second disk means relative to the other to and fro upwardly and downwardly along first and second central axis structure such that distance between the first face and the second face is variable; X-ray means axially extending transversely substantially centrally through one of the first and second disk means, for directing radiation laterally between the first and second flat faces, the X-ray means being mounted such that it is independent of rotation of the first and second disk means; gas-injection means having passage structure defining a passage extending about centrally through at least one of said first and second disk means, for gas injection into and exhaustion of gas from inner-tire space of a tire vise-mounted with opposite side-walls thereof sealably between the first and second disk means; projection screen means having a projection surface mounted to extend substantially transversely to and aligned with the space between said first and second planes and in alignment with and substantially perpendicular to said laterally directed radiation from said X-ray means; the projection screen means including said projection surface, spring lever elements, and screen-mounting elements operatively interconnected for moving the screen surface substantially perpendicularly to and fro alternately toward and away from the X-ray means; and a part of the lever elements being spring-biased by the spring lever elements to be positioned against and for movement by an outer tire tread of a tire being mounted between the first and second flat faces such that the screen projection surface becomes positioned distantly from the X-ray means when a tire of larger diameter is mounted and becomes positioned closer when a tire of small diameter is mounted between the first and second disks, said plate moving means including a light-receiving element and switch circuitry connected thereto such that blocking of light to the light-receiving element causes movement of one or more of the first and second disk means toward one-another to terminate automatically, the light-receiving element being positioned to receive a light beam between the first and second disk means and for a tire mounted therebetween to block a beam of light to the light-receiving means when the tire's opposite side walls become both engaged between the first and second disk means.

3,883,745

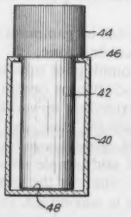
COMBINED HOLDER AND ADAPTER FOR LIQUID SCINTILLATION COUNTERS

Herman Glasser, New Hyde Park, N.Y., assignor to Nuclear Associates, Inc., Westbury, N.Y.

Continuation of Ser. No. 15,577, Feb. 27, 1970, abandoned. This application June 18, 1973, Ser. No. 371,271

Int. Cl. G01t *1/20*

U.S. Cl. 250—363 **4 Claims**



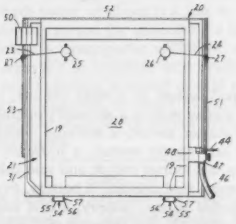
1. A method for assaying radioactivity of a sample of a liquid, using a liquid scintillation counter having a standard sample container wherein the standard sample container has a standard outer cross-section and defines an interior space having a standard volume, including a standard interior height and a standard interior width,

the sample of the liquid being tested having a relatively small volume less than the standard volume, the method comprising placing the relatively small sample in a sample inner container, the sample inner container having an outer cross-section and defining an interior space having a height at least equal to the standard interior height and a width less than the standard interior width; removably inserting the sample inner container into an adapter holder formed of a clear, transparent material, the adapter holder comprising a longitudinally extending side wall defining an inner cross-section and an outer cross-section, the outer cross-section being substantially congruent to the standard outer cross-section and the inner cross-section of the adapter holder being larger than the outer cross-section of the inner container, but providing a relatively close fitting relationship along at least a portion of the longitudinally extending sidewall of the adapter holder so as to center the sample inner container within the adapter holder; whereby when the adapter holder, including the sample inner container inserted therewithin, is placed into the scintillation counter, the scintillation counter can accurately assay the radioactivity of the relatively small sample contained within the sample inner container.

3,883,746
DAYLIGHT-LOADING FILM-HOLDER FOR EXPOSING VERTICALLY DISPOSED X-RAY FILM

Charles J. Gifford, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 23, 1973, Ser. No. 418,418
Int. Cl. G03b *41/16*
U.S. Cl. 250—475 **6 Claims**



1. A rapidly loaded film-holder adapted to be mounted in a vertical position and to hold X-ray film under vacuum pressure while the film is exposed, comprising (1) a shallow receptacle that comprises a rigid large-area back plate and edgewalls attached around the periphery of the back plate, the edgewalls extending perpendicularly from one side of the back plate to define an open front of the receptacle, and the edgewalls comprising at least at their outer extremity a resilient gasket member that extends continuously around the open front of the receptacle and whose outer extremity defines a single plane; (2) a rigid large-area front plate pivotably attached to the receptacle in position to rest against the outer extremity of the gasket member to close the receptacle and adapted to be drawn toward the back plate a uniform amount over the whole area enclosed by the gasket member; (3) a pressure plate supported in front of and parallel to the back plate; (4) a first intensifying screen attached over the pressure plate and a second intensifying screen attached over the inside surface of the front plate; (5) limiting means for limiting pivotal movement of the front plate from its closed position to an opened rest position; (6) positioning means on said front plate for holding said X-ray film in defined positions on the inside surface of the front plate; (7) engagement means for holding the front plate in closed position in engagement against the gasket member; and (8) an exhaust port located in the receptacle or front plate for attachment to a vacuum source, whereby a vacuum may be formed within the film-holder to draw the front plate toward the bottom plate and tightly sandwich film between the two intensifying screens.

3,883,747
X-RAY INTENSIFYING SCREEN

Robert H. Murashige, Los Altos, and Henry L. Myers, San Jose, both of Calif., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

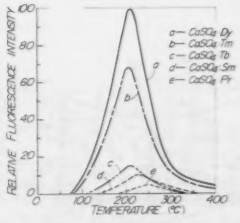
Filed Dec. 6, 1973, Ser. No. 422,280
Int. Cl. H01j *1/62*
U.S. Cl. 250—483 **4 Claims**

1. An X-ray intensification screen comprising a substrate support coated with dispersion of a phosphor having the formula $[M_{x-1}\ Tb_x]_2\ O_2S$ wherein M is lanthanum, gadolinium or yttrium and x has a value in the range 0.003 to 0.08 and a dye preferentially absorbing green light in a transparent binder, the dye content being equal to from 0.0003 to 0.5 percent by weight of the contained phosphor.

3,883,748
PHOSPHOR FOR THERMOLUMINESCENT TYPE RADIATION DOSIMETER

Naohiro Nada, Nishinomiya, and Tadaoki Yamashita, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 96,995, Dec. 10, 1970, abandoned, which is a continuation of Ser. No. 709,757, March 1, 1968, abandoned. This application Apr. 13, 1973, Ser. No. 350,728
Claims priority, application Japan, June 29, 1967, 42-42231; Dec. 28, 1967, 42-90231; Dec. 28, 1967, 42-91231; Dec. 28, 1967, 42-92231
Int. Cl. G01t *1/11*
U.S. Cl. 250—484 **1 Claim**



1. A process for measuring radiation dose by the thermoluminescence of calcium sulfate comprising

irradiating a thermoluminescent phosphor containing calcium sulfate as the principal constituent and an impurity element selected from the group consisting of dysprosium, thulium, terbium and praseodymium,

heating said irradiated thermoluminescent phosphor to above the maximum glow peak temperature of said impurity element to emit light, and

measuring the emitted light from said phosphor and determining the radiation dose therefrom.

3,883,749
RADIO OPAQUE GLOVES

Arthur V. Whittaker, Poland, Ohio; Ralph E. Whittaker, Jr., Upper Saint Clair, Pa.; Robert A. Goldstrom, New Kensington, Pa., and Frederick J. Shipko, Spring Church, Pa., assignors to Arco Nuclear Company, Leechburg, Pa.

Filed Aug. 15, 1972, Ser. No. 280,909
Int. Cl. G21f *3/02*
U.S. Cl. 250—516 **2 Claims**

1. A glove protecting the wearer from a significant portion of the radiation hazards of fluoroscopic systems consisting of thin polymeric films having inner and outer unloaded layers

and an internal layer containing a screening agent of the class consisting of depleted uranium dioxide, lead oxide, and mixtures thereof, said film containing from 10 per cent to 45 per cent by weight of said screening agent, and said film having an average thickness within the range from 5 mils to 25 mils, various portions of the film being at least 25 per cent thicker

than other portions to provide greater protection from radiation at such thicker portions, the thinner portions being not more than 10 mils thick, whereby sensitivity through such thin portion is preserved, such thinner portions being at the fingertip portion of the glove whereby tactile sensitivity through the fingertip is enhanced to permit a surgeon to employ such gloves within a fluoroscopic radiation zone.

3,883,750

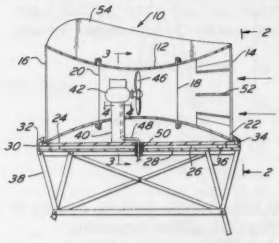
METHOD AND APPARATUS FOR GENERATING POWER FROM WIND CURRENTS

Rudyard S. Uzzell, Jr., Bryn Mawr, Pa., assignor to Natural Energy Systems, Inc., Philadelphia, Pa.

Filed Jan. 30, 1974, Ser. No. 437,948

Int. Cl. F03d 9/00

U.S. Cl. 290—55 **8 Claims**



1. A wind-driven energy-generating device comprising a Venturi-shaped chamber having a central throat portion and enlarged end portions at opposite sides of said throat portion, one end portion being an upstream end portion and the other a downstream end portion, both of said end portions being open, said chamber being mounted for rotation on an axis provided by a first support means, a second support means extending into said throat portion, said second support means being positioned downstream from said first support means whereby said second support means is eccentric to said first support means, an energy generating means mounted on said second support means, a fan connected to said energy-generating means, said fan being mounted for rotation on said second support means within said throat portion, said throat portion being free of fixed blade construction, said fan being radially spaced from the wall area defining said throat portion, said second support means, energy generating means and fan having a center of gravity offset from said axis provided by said first support means and a wind-operable orienting rudder, said rudder extending longitudinally of said chamber and being positioned radially outward of said chamber.

3,883,751

ELECTRICAL SYSTEMS FOR VEHICLE SAFETY HARNESS

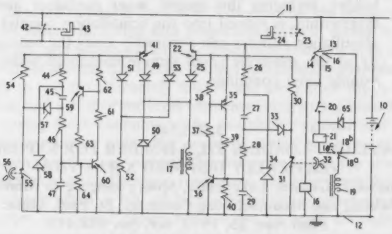
Peter Hugh Salway, Birmingham, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Jan. 11, 1974, Ser. No. 432,614

Claims priority, application United Kingdom, Feb. 7, 1973, 6011/73

Int. Cl. B60r 21/10

U.S. Cl. 307—10 SB **4 Claims**



1. An electrical system in a road vehicle, comprising in combination: a starter motor, a manually operable switch for energizing said starter motor, a solenoid which when energized operates said starter motor, a normally closed relay contact between said starter switch and said solenoid, a relay winding for opening said contact, a battery, first and second supply lines coupled to said battery, a first control network connecting said relay winding between said supply lines when the driver's seat of said vehicle is occupied and the driver's seat belt is not fastened, and a second control network connecting said relay winding between said supply lines when the passenger's seat is occupied and the passenger's seat belt is not fastened, each of said first and second control networks comprising a seat switch which is closed when the associated one of said seats is occupied, a seat belt switch which is opened when the associated one of said seat belts is fastened, a first transistor having its collector/emitter path in series with said seat switch and said relay winding between said supply lines, a first resistor connected between said seat belt switch and the base of said first transistor, said seat belt switch when closed rendering said first transistor conductive so that said relay winding is energized when said seat switch is also closed, and latch circuit means connected to the base of said first transistor, rendering said first transistor conductive if said seat belt switch is opened before said seat switch is closed and comprising second and third transistors having their collector/emitter paths in parallel circuits between the base of said first transistor and one of said supply lines, and their bases connected in said parallel circuits so that said second and third transistors are both conductive or non-conductive simultaneously, each maintaining the other in its conductive or non-conductive state, a capacitor connected between said seat switch and the base of said third transistor, and a diode connecting said capacitor via said seat belt switch to said one of said supply lines.

3,883,752
OPTICAL MATERIAL

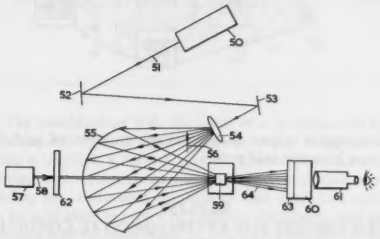
Philip Hywel Davies; Maurice Vernon Hobden; Kenneth Fraser Hulme, and Oliver Jones, all of Malvern, England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 71,666, Sept. 14, 1970, Pat. No. 3,696,038, which is a continuation-in-part of Ser. No. 689,175, Dec. 8, 1967, abandoned. This application Mar. 6, 1972, Ser. No. 232,039

Claims priority, application United Kingdom, Dec. 9, 1966, 55201/66

Int. Cl. H03f *7/04*

U.S. Cl. 307—88.3 **4 Claims**



1. A non-linear radiation frequency mixing device comprising a synthetic cell-free optically transparent crystal having dimensions significantly greater than one millimeter of a material selected from the group of materials consisting of Ag_3AsS_3, Ag_3SbS_3 and a solid solution of $Ag_3As_xSb_{1-x}S_3$ ($1 \quad x \quad 0$), said crystal being optically transparent in a major part of the wavelength range of about 0.6 μm to 13 μm; and at least one generating means for generating a beam of intense coherent optical electromagnetic radiation, said generating means being arranged to irradiate said crystal whereby the frequency of said radiation is mixed in said crystal with another frequency to produce, by virtue of the non-linear electric properties of said material, an output frequency related to said mixed frequencies.

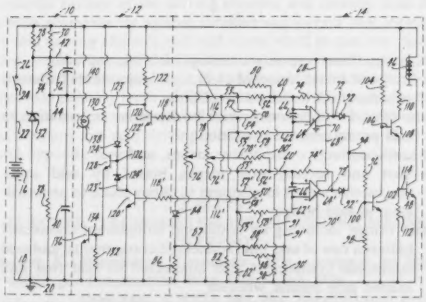
3,883,753
THERMOCOUPLE-FAILURE WARNING CIRCUIT

Clarence E. Harrison, Jr., Madison Heights, and Siang-Shen Johnson Yun, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,954

Int. Cl. H01h *35/00*

U.S. Cl. 307—117 **6 Claims**



1. A thermocouple-failure warning circuit for use with a thermocouple-controlled operational amplifier, said warning circuit comprising, in combination, first and second voltage supply leads for connection to a source of DC electrical potential; a thermocouple having first and second leads coupled to input terminals of said operational amplifier, said thermocouple first lead being coupled to said first voltage supply lead; a resistor, said thermocouple second lead being coupled through said resistor to said second voltage supply lead; a warning device; a transistor having an output circuit and a control electrode, the output circuit of said transistor being connected with said warning device to control the actuation of said warning device; first circuit means for coupling said warning device and transistor output circuit across a source of electrical potential; and second circuit means for changing the state of conduction of the output circuit of said transistor if either said thermocouple is open-circuited between its first and second leads or if said thermocouple is short-circuited to the electrical potential of said second voltage supply lead, said circuit means being connected to said transistor control electrode and having an input electrical lead connected to said thermocouple second lead, whereby, said warning device may be actuated by a change in the state of conduction of aid transistor output circuit if said thermocouple is open-circuited or short circuited.

3,883,754
FREQUENCY-VOLTAGE CONVERTER CIRCUIT, PARTICULARLY FOR AUTOMOTIVE APPLICATIONS

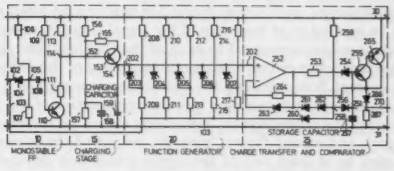
Helmut Fleischer, Schwieberdingen, and Eberhard Schnaibel, Hemmingen, both of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Feb. 7, 1974, Ser. No. 440,371

Claims priority, application Germany, Mar. 21, 1973, 2314016

Int. Cl. G06g *7/24*

U.S. Cl. 307—229 **14 Claims**



1. Frequency-voltage converter circuit having a monostable flip-flop (FF) (**10**) to which a signal of varying frequency is applied;

charge storage means (**159**) connected to the monostable FF (**10**) to be charged upon change of state thereof;

a function generator (**15**) controlling the discharge of said charge storage means and providing for a hyperbolic discharge rate thereof;

a storage capacitor (**257**) and a charge transfer circuit therefor, the charge storage capacitor being charged to a value representative of the charge, or remaining charge, of the charge storage means, after discharge through the function generator;

wherein the improvement comprises an operational amplifier (**252**) forming part of the charge transfer circuit (**25**), and a discharge circuit for the storage capacitor (**257**) including a discharge diode (**254**), said discharge circuit being connected to and controlled by the output of the operational amplifier (**252**).

3,883,755

ELECTRONIC PHASE-SENSITIVE DETECTOR CIRCUIT WITH D.C. DRIFT NEUTRALIZATION

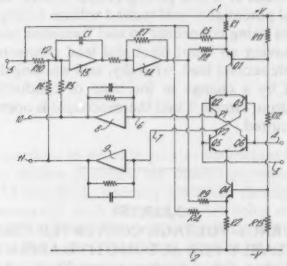
Eric Andrew Faulkner, Home Close, Bradcutts Ln., Cookham Dean, Berkshire, England

Filed Nov. 20, 1973, Ser. No. 417,617

Claims priority, application United Kingdom, Nov. 30, 1972, 55255/72

Int. Cl. H03d *13/00, 1/18*

U.S. Cl. 307—232 6 Claims



1. An electronic phase-sensitive detector circuit comprising two sections each of which sections comprises a signal translation device and two alternative paths for current therethrough with a switching device in each path, the switching devices of one section being complementary to the switching devices of the other section, connection means for enabling reference signals to be applied so as to cause one or other of the switching devices of each section to conduct depending on the polarities of the reference signals, junctions between respective paths of the two sections through which current conduction is simultaneous, connection means for enabling an input signal to be applied to at least one of the signal translation devices, output means connected to each of the said junctions to provide respective output signals representative of the difference in current flows between the two paths connected to a junction, means for obtaining a signal representative of the mean value of the output signals, integrating means for the aforesaid signal, and means for applying the output of the integrating means to at least one of the signal translation devices in a manner to tend to neutralise dc drift.

3,883,756

PULSE GENERATOR WITH AUTOMATIC TIMING ADJUSTMENT FOR CONSTANT DUTY CYCLE

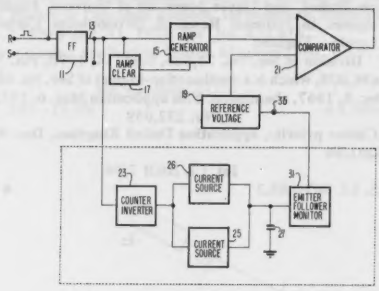
Thomas J. Dragon, Southfield, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 27, 1973, Ser. No. 428,730

Int. Cl. H03k *5/04*

U.S. Cl. 307—265 5 Claims

1. Circuitry for generating a train of substantially rectangular pulses in response to a train of trigger signals comprising:
flip-flop means having set and reset states and an output, said output being set by each of said trigger signals, to initiate a said rectangular pulse;
means for generating ramp voltage signals having identical initial levels, each generation being activated when said flip-flop means is set and deactivated when said flip-flop means is reset;
reference means for generating a reference voltage level;
means for resetting said flip-flop upon equality of said reference and ramp voltages to terminate a said rectangular pulse; and
means for automatically varying said reference voltage level in accordance with the variation in the time lapse between said pulses so as to maintain the duration of said



rectangular pulses as a constant multiple of said time lapse between said pulses.

3,883,757

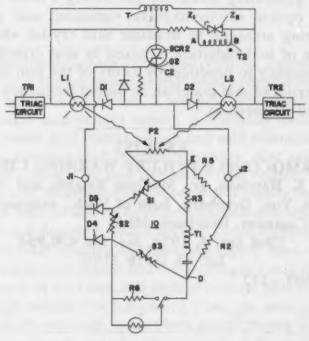
BRIDGE CIRCUIT FOR ENVIRONMENTAL CONDITION CONTROL

Frederick N. Lancia, 1260 Gresham Rd., Columbus, Ohio 43204; Albert O. Kesterson, 6566 Calgary Ct., Columbus, Ohio 43239, and Ralf C. Liebert, 580 Keys Ln., Worthington, Ohio 43085

Filed Apr. 20, 1972, Ser. No. 245,872

Int. Cl. H03k *3/42*

U.S. Cl. 307—311 10 Claims



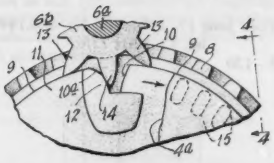
1. A condition responsive control circuit comprising:
a bridge of interconnected electrical components balanced at some predetermined condition,
one of said components variably responsive to variation to said predetermined condition,
a semi-conductive responsive means, and
a first and second gate means biased by said semi-conductive means in response in either phase to an unbalance in said bridge;
said bridge including an additional component connected between two of said interconnected components, and said additional component also connected to said first and second gate means, wherein
said additional component operative to provide a set point for said variably responsive component comprises a pair of diodes and a variable resistor, one of said diodes current conducting and the other of said diodes blocking in dependance upon the direction of current flow through said resistor.

3,883,758

ONE-WAY DIRECTION CONTROL FOR SYNCHRONOUS MOTORS

Walter L. Lechner, New Providence, R.I., assignor to Engler Instrument Company, Jersey City, N.J.

Filed May 24, 1974, Ser. No. 473,069
Int. Cl. H02k 7/10
U.S. Cl. 310—41 7 Claims



1. The combination with the shaft of a synchronous motor that is capable of starting to rotate in either direction when current is applied, a driving element rotatable about an axis, a driving connection between said shaft and said element providing for continuous rotation of said shaft and said element by said shaft in either of opposite directions, and means permitting said rotation freely in one direction and for blocking rotation in the opposite direction, said means comprising a pinion having a cylindrical body rotatably mounted on an axis parallel to said axis of the driving element and disposed in spaced relation to the periphery of said driving element, said driving element having a circumferential smooth surface and a notch opening through said circumferential surface and one end surface of said driving element and also having a lug projecting from said end surface at one side of said notch, said body of said pinion having a plurality of equidistantly circumferentially spaced teeth, certain of which denoted primary teeth are of a radial length to enter and leave said notch during revolution of said driving element in one direction and are of a length longitudinally of said body to engage said circumferential smooth surface of said driving element while alternate teeth denoted secondary teeth are of a length longitudinally of the said body to be engaged by said lug on said driving element upon revolution of said element in either direction, each of said secondary teeth and the two of said primary teeth at opposite sides of each secondary tooth being so related to each other, to said notch and to said lug on said driving element that upon rotation of said driving element in one direction said lug will engage said secondary tooth and rotate said pinion to move one of said primary teeth into and out of said notch in the driving element and dispose both of said two primary teeth in relatively slidable contact with said circumferential surface of the driving element and thereby hold the pinion momentarily against rotation and permit free rotation of said driving element and said motor shaft in said one direction, while when the driving element is urged to rotate in the opposite direction said lug will engage said secondary tooth so that said primary teeth which are in contact with said circumferential surface on the driving element will block rotation of said pinion and said driving element and said motor shaft in said opposite direction.

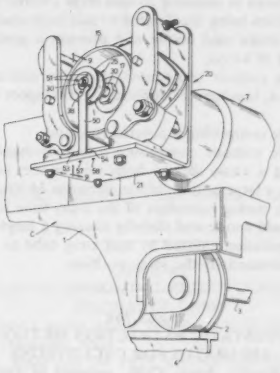
3,883,759

ELECTRIC TACHOMETER AND MOUNTING MEANS THEREFOR

Robert E. Mierendorf, Greendale, Wis., assignor to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Sept. 4, 1973, Ser. No. 394,058
Int. Cl. H02k 5/26
U.S. Cl. 310—91 8 Claims

1. In combination: an electric motor having a housing; a rotatable first shaft driven by said motor and having an axis; a plate member lying in a plane generally parallel to and spaced from said axis, said plate being in a fixed position position with respect to said motor housing; said first shaft being capable of exhibiting nonrotational movement in any direction transverse to or parallel to said plate member during rotation; motor control means for said motor; and electric tachometer comprising a stator and a rotor for measuring rotary motion of said first shaft and for providing an electric output signal related thereto to said rotor control means for effecting controlling of said motor, said stator having a hole therein; connecting means including a stub shaft engageable with said stator for connecting said rotor to an end of said first shaft to effect rotation of said rotor and so that said first shaft affords mechanical support to said tachometer and effects nonrotational movement of said tachometer; and restraining means to prevent rotational movement of said stator but to



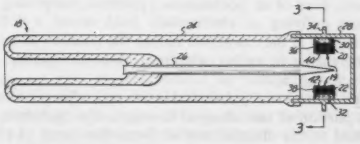
permit nonrotational movement of said tachometer in any direction transverse or parallel to said plate member resulting from nonrotational movement of said first shaft, said restraining means comprising a first member connected to and extending from said stator toward said plate member, said restraining means further comprising a pair of spaced apart threaded holes in said plate member, a pair of second members spaced apart from each other in a direction transverse to said axis for engagement with said first member, each of said second members having a slot therethrough, the longitudinal axis of each slot being disposed in a direction transverse to said axis, and bolts for adjustably securing said second members in desired positions, each bolt extending through the slot in its associated member and into an associated hole in said plate member.

3,883,760

FIELD EMISSION X-RAY TUBE HAVING A GRAPHITE FABRIC CATHODE

Thomas C. Cunningham, Jr., Ann Arbor, Mich., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Apr. 7, 1971, Ser. No. 131,881
Int. Cl. H01j 35/06
U.S. Cl. 313—55 1 Claim



1. In a field emission x-ray tube requiring a large electric potential in order to provide x-rays and having an evacuated

envelope with an anode mounted within said envelope, the improvement comprising:

a field emission cathode formed from a woven fabric, said fabric having a predetermined number of threads disposed in a first direction and having free ends for emitting electrons, a second predetermined number of threads disposed in a second direction, said second number of threads crossing and supporting said electron emitting threads;

said fabric also having a sufficiently high resistivity to temperature to resist erosion by melting and sublimation during operation of the field emission x-ray tube, a sufficiently high tensile strength to resist being pulled apart by the large electric potential required by the field emission x-ray tube during operation, and a sufficiently low electric resistivity to provide a predetermined large number of electrons in response to said large electric potential;

said electrons being accelerated by said large electric potential to strike said anode and provide a predetermined number of x-rays;

said fabric cathode being mounted within said envelope in a spaced, insulated relationship with respect to said anode;

said anode comprising a pointed rod; and

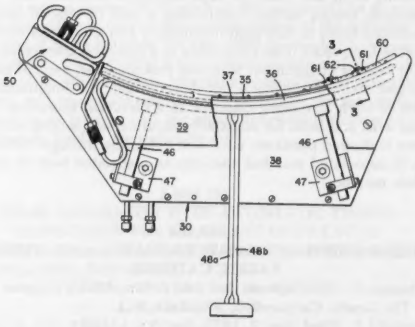
said fabric cathode comprising a washer-shaped annulus defining a plane spaced from said anode, said spacing causing a large portion of the electrons emitted from said cathode during operation of the x-ray tube to strike the tip of said anode and thereby causing a large portion of the x-radiation emitted by said x-ray tube to be emitted from substantially the same position.

3,883,761

ELECTROSTATIC EXTRACTION METHOD AND APPARATUS FOR CYCLOTRONS

George O. Hendry, Napa, Calif., assignor to The Cyclotron Corporation, Berkeley, Calif.

Filed Dec. 8, 1972, Ser. No. 313,451
Int. Cl. H05l *13/08*
U.S. Cl. 313—62 **3 Claims**



1. Improved apparatus for electrostatically deflecting a beam of charged particles at an extraction radius in the fringe magnetic field of an isochronous cyclotron comprising

means defining an electrostatic field across a deflection channel at the extraction radius, the location of said field increasing in radius with respect to the center of the cyclotron; and

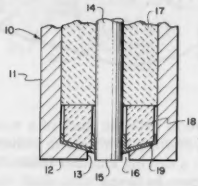
magnetic material positioned inside and adjacent to at least a portion of said channel to reduce the cyclotron fringe field at the channel and to focus the beam of charged particles radially with respect to the center of the cyclotron, by concentrating the lines of magnetic force of said fringe field inwardly of but immediately adjacent to said channel to reduce said fringe field and then to reverse the normally decreasing field gradient in said channel.

3,883,762

ELECTRICAL DISCHARGE DEVICE COMPRISING AN INSULATOR BODY HAVING AN ELECTRICALLY SEMI-ONDUCTING COATING FORMED THEREON

Robert C. Harris, Unadilla, and Helmut P. Meyer, Sidney, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed June 17, 1974, Ser. No. 480,199
Int. Cl. H01t *13/02*
U.S. Cl. 313—130 **5 Claims**



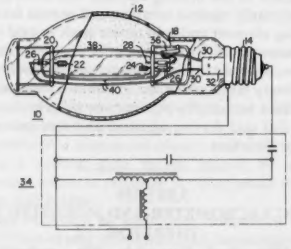
1. In a shunt-type igniter plug comprising an outer metal shell, a ground electrode integral with said shell, a central electrode having a firing tip, said central electrode mounted in an insulator disposed within said shell, the firing tip of said central electrode being in opposed spaced relation to the ground electrode forming a spark gap therebetween, and improved electrically semi-conducting means adjacent said spark gap and in electrical contact with the opposed electrodes, said improved electrically semi-conducting means comprising a beryllium oxide ceramic body disposed about said central electrode, said ceramic body having formed thereon and bonded thereto an electrically semi-conducting coating, said coating comprising a sintered mixture of lanthanum oxide and cuprous oxide, said coating being in electrical contact with said opposed electrodes and forming a bridge across said spark gap.

3,883,763

SELF-CONTROLLED ARC STREAM IN GASEOUS DISCHARGE LAMPS

Joseph P. Kearney, Teaneck, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 16, 1974, Ser. No. 506,640
Int. Cl. H01j *17/14*
U.S. Cl. 313—154 **4 Claims**



1. In combination with a discharge lamp of the type wherein an elongated arc tube having a main electrode in either end, between which electrodes an arc is established during operation, and which arc tube is contained within a light transmitting outer envelope, the improvement which comprises:

at least three refractory metal conductors located inside of said outer envelope, and outside and in close proximity to

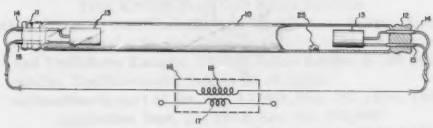
said arc tube and running generally parallel to the longitudinal axis of said arc tube, said conductors being electrically connected in series with said main electrodes and being electrically connected such that when said lamp is operated with said arc other than substantially vertical, at least one of said conductors is generally above said arc tube and is carrying current in the same direction as said arc, and at least two of said conductors are generally below said arc tube and carrying current in the opposite direction as said arc, whereby the magnetic effect from the current in both the conductor above the arc tube and the conductors below the arc tube tends to counteract the natural upward bowing of the arc.

3,883,764

CATHODE STRUCTURE FOR HIGH CURRENT, LOW PRESSURE DISCHARGE DEVICES

Peter D. Johnson, Schenectady, and John M. Anderson, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 4, 1974, Ser. No. 448,018
Int. Cl. H01j *61/08*
U.S. Cl. 313—212 **11 Claims**



1. In a high current, low pressure discharge device including an evacuable envelope having a partial pressure of an ionizable material therein and electrode structures for establishing an electric discharge therein, said electrode structures including an improved cathode structure comprising:
a refractory metal cylinder;
an emissive mix coated filament coaxially supported within said cylinder;
means for electrically connecting the ends of said filament together; and means for applying a voltage to said electrode structures for establishing an electric discharge within said envelope.

3,883,765

HIGH-PERFORMANCE EMITTER FOR THERMOELECTRONIC DIODES

Jean-Paul Durand, Paris; Jacques Gillardeau, Longjumeau, and Robert Faron, Nyon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 25, 1973, Ser. No. 363,867
Claims priority, application France, June 2, 1972, 72.19985
Int. Cl. H01j *1/14, 19/06*
U.S. Cl. 313—346 **11 Claims**

1. A high-performance emitter for thermoelectronic diodes comprising a fissile fuel member, at least one refractory metal emitting layer deposited on the periphery of said member, said fissile fuel member being a solid bar, radial cuts, in said bar

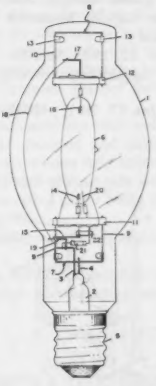
said cuts forming reinforcing hoops when said layer has been deposited.

3,883,766

METHOD OF OPERATING HIGH-INTENSITY ARC DISCHARGE LAMP

Timothy Fohl, Carlisle, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed July 19, 1973, Ser. No. 380,739
Int. Cl. H01j *17/16*
U.S. Cl. 313—220 **3 Claims**

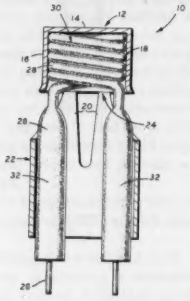


1. In a high-intensity arc discharge lamp having a generally tubular arc tube disposed within an outer envelope, the arc tube having an electrode at each end, the improvement which comprises an expanded section in the arc tube intermediate the electrodes, the shape of the expanded section being such as to eliminate radial convective flow between the upward and downward convective flows within the arc tube during normal lamp operation.

3,883,767
HEATER FOR FAST WARMUP CATHODE

William E. Buescher, and Donald R. Kerstetter, both of Emporium, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 8, 1974, Ser. No. 440,684
Int. Cl. H01j 1/15, 19/08; H01k 1/02
U.S. Cl. 313—341 2 Claims

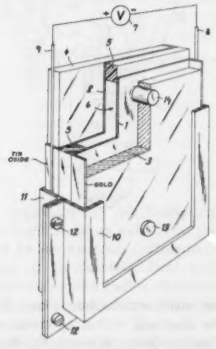


1. A heater for a fast warmup cathode comprising: a metallic, electrically conductive core; and an electrically insulating coating surrounding said core; said heater being formed to provide a coiled body having a pair of legs extending therefrom, the height of said coiled body being small compared with the length of said legs; the insulating coating on said pair of legs having a thickness about 400% greater than the thickness of the insulating coating on the coils of said coiled body portion.

3,883,768
ELECTROLYTIC LIGHT SOURCE

Michel Voïnov, and James Dunnett, both of Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Geneva, Switzerland

Filed Nov. 12, 1973, Ser. No. 414,825
Claims priority, application Sweden, Nov. 13, 1972, 16470/72
Int. Cl. H01j ; H01k
U.S. Cl. 313—358 19 Claims

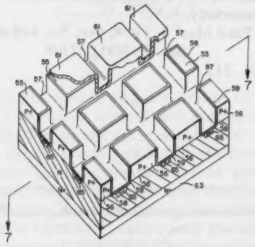


1. An electrolytic light source comprising:
a pair of electrodes with broad parallel surfaces closely confronting each other, at least one of said electrodes being optically transparent;
nonconductive spacing means holding said electrodes apart by a distance of not more than about 50 microns and forming therewith a fluidtight chamber;
an ionically conductive liquid in said chamber including a fluorescent material dissolved therein; and
a supply of direct current for placing across said chamber a continuous voltage difference of not more than about 5 volts sufficient to ionize a constituent of said liquid with release of cations and anions whose interaction induces the emission of luminous energy by said fluorescent material, said electrodes respectively forming an anode and a cathode connected across said source.

3,883,769
VIDICON CAMERA TUBE AND TARGET

Ronald M. Finnila, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 19, 1971, Ser. No. 173,207
Int. Cl. H01j 29/45, 31/38
U.S. Cl. 313—367 3 Claims



1. A vidicon camera tube comprising:
A. an evacuated envelope having a radiation transmissive window;
B. a charge storing target facing said window and including:
1. an N conductivity type silicon substrate disk having an array of P+ conductivity mesas extending from one of its two major faces, each said mesa forming a P-N junction with the underlying portion of said substrate;
2. a silicon dioxide layer covering the wall of said mesas and the surface of said substrate between said mesas;
3. a P+ conductivity type grid formed of said substrate immediately below that portion of the substrate surface that is covered by said silicon dioxide layer entirely below the level of said P-N junctions, and spaced from said array of mesas; and
4. an N+ conductivity type layer formed of the other of the two major faces of said substrate, said other substrate face being next to said window; and
C. means facing said array of mesas for generating a beam of electrons and means for scanning said array of mesas therewith.

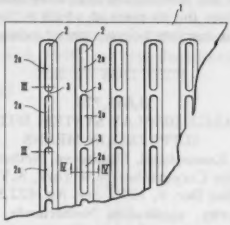
3,883,770
COLOUR PICTURE TUBES

Junichi Yamada, and Etuzo Terashima, both of Mobara-City, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 4, 1973, Ser. No. 321,019
Claims priority, application Japan, Jan. 19, 1972, 47-008061
Int. Cl. H01j 29/06
U.S. Cl. 313—403 10 Claims

1. In a color picture tube comprising a colour selecting member provided with a plurality of stripe shaped parallel perforations extending in a direction parallel to one side of the picture displayed by said tube, each stripe shaped perforation being divided into a plurality of slit shaped sections by means

of spaced apart bridges extending across said perforation in a direction perpendicular to said first mentioned direction, a fluorescent screen including a plurality of stripe shaped phosphors corresponding to said stripe shaped perforations, and an electron gun assembly, the improvement wherein the height of



said bridges is made approximately one-half the thickness of said colour selecting member so that adjacent said slit shaped sections are separated by said bridges on the side facing to said electron gun assembly whereas they merge with each other on the side facing to said fluorescent screen to form said perforation as continuous stripe shaped openings.

3,883,771

COLLINEAR ELECTRON GUN SYSTEM INCLUDING ACCELERATING GRID HAVING GREATER EFFECTIVE THICKNESS FOR OFF AXIS BEAMS

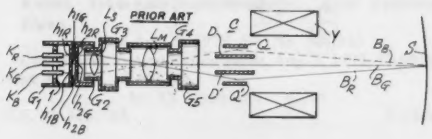
Akio Ohgoshi, 5-6 Akabane-Kita 1, Kita-ku, Tokyo; Senri Miyaoka, Jutaku No. 13, 1-chome, Fujosawa-shi, Kanagawa, and Yosihiharu Katagiri, 18-104 Fujimi Jutaku, 6-189 Fujimi-cho, Tachikawa-shi, Tokyo, all of Japan

Continuation-in-part of Ser. No. 13,909, Feb. 25, 1970. This application Sept. 21, 1972, Ser. No. 290,985

Claims priority, application Japan, Mar. 7, 1969, 44-17325

Int. Cl. H01j *29/50, 31/20*

U.S. Cl. 313—412 **10 Claims**



1. A cathode ray tube comprising: a screen; and electron gun means comprising beam producing means including a first set of cathode and control grid means providing a central beam source located on the axis of the tube for directing a central electron beam along said axis toward said screen and second and third sets of cathode and control grid means providing said beam sources spaced from said central beam source at opposite sides of the latter for directing respective side beams toward said screen in a common plane containing said axis of the tube, accelerating grid means spaced from said control grid means in the direction toward said screen and having a central aperture and two side apertures respectively aligned with said central and side beams, and a main focusing lens comprising a plurality of electrode means arranged in sequence along said axis between said accelerating grid means and said screen, said accelerating grid means cooperating with said beam producing means to establish electric fields for narrowing said beams to minimum cross-sections at respective crossover points adjacent said accelerating grid means, means for directing said side beams to intersect said central beam at a location in the main focusing lens whereby said side beams pass through the main focusing lens at angles to said axis and the focusing effect thereon is different from that on said central beam, said cathode and control grid means being substantially equidistant from each other in said first, second and third sets thereof and said control grid means of said first, second and third sets being substantially equidistant from said location in said main focusing lens where said side beams intersect said central beam, said accelerating grid means having greater effective thickness at said portions thereof containing said side apertures than at the portion thereof containing said central aperture, whereby an electric field established between said accelerating grid means and said electrode means of said main focusing lens panetrates said central and side apertures of the accelerating grid means to different extents and thereby disposes said crossover points of said side beams and said central beam, respectively, at different distances from said main focusing lens to compensate for said different focusing effects.

3,883,772

ELECTRIC LIGHT-EMITTING APPARATUS

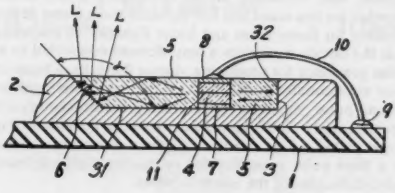
Kazuo Wako, Joyo, and Kenichi Konishi, Kyoto, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Apr. 26, 1973, Ser. No. 354,885

Claims priority, application Japan, May 2, 1972, 47-44139

Int. Cl. H01j *1/62, 63/04*

U.S. Cl. 313—499 **7 Claims**



1. A light-emitting apparatus, comprising:
an electrically conductive substrate having a predetermined number of recesses, each recess having a flat bottom, smooth vertical side walls and an oblique side wall having a rough surface for diffused reflection, said oblique side wall defining an obtuse angle with the flat bottom;
a light-emitting diode secured on the bottom of each of said recesses, one electrode thereof being electrically connected to said bottom;
a transparent light-conductive resin wafer tightly embedded in each of said recesses and surrounding said light-emitting diode, an oblique light reflecting roughened face being defined by said oblique side wall, light rays emitted from the light-emitting diode being thereby reflected out from the wafer;
an insulating substrate supporting said conductive substrate; and,
a wire connecting the other electrode of each of said light-emitting diodes to a connecting tab on said insulating substrate.

3,883,773

DEVICE COMPRISING A TELEVISION CAMERA TUBE

Johannes Hendrikus Theodorus van Roosmalen, and Joannes Cornelis Vermulst, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 9, 1970, Ser. No. 53,419

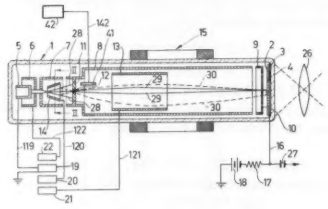
Claims priority, application Netherlands, July 11, 1969, 6910673

Int. Cl. H01j *31/26*

U.S. Cl. 315—10 **7 Claims**

1. A device comprising a television camera tube, which tube has a target plate for integrating the picture information of a scene to be recorded and an electron gun for producing an

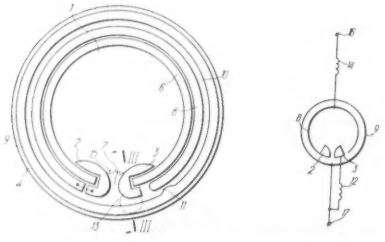
electron beam directed towards the target plate, said electron gun comprising a cathode, a control grid and an acceleration anode, a diaphragm being present in said tube between the control grid and the target plate to limit the electron beam, said device comprising a focusing lens to focus the electron beam onto the target plate, and deflection means for periodically scanning the target plate by the said diaphragm-limited electron beam for stabilisation of the potential of the target plate at substantially the cathode potential for producing output signals corresponding to the integrated picture information, said deflection means comprising a line deflection member for line scans and line flybacks and a frame deflection member for frame scans and frame flybacks, characterized in that the device comprises a lens element connected to a first pulse generator for producing, during flybacks, a beam crossover substantially at the area of the said diaphragm and a second pulse generator for producing simultaneously a cathode potential which is increased relative to the potential of the target plate, and an additional deflection member connected to a third pulse generator for producing during flybacks an extra deflection of the electron beam.



3,883,774
LIGHTNING ARRESTER SPARK GAP

Vladimir Andreevich Volkenau, 11 Parkovaya ulitsa 48, korpus 2, kv. 61; Gennady Georgievich Lavrentiev, Ketcherskaya ulitsa 6, korpus 2, kv. 125, and Vitaly Vladislavovichs Shmatovich, Meierovsky prospekt, 28, korpus 1, kv. 50, all of Moscow, U.S.S.R.

Filed Apr. 24, 1974, Ser. No. 463,789
Int. Cl. H01j *19/78*
U.S. Cl. 315—58 **4 Claims**

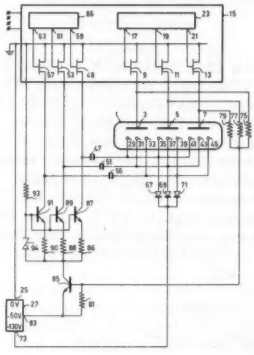


1. A lightning arrester spark gap comprising: two plates of arc-resisting insulating material, forming a narrow arc interrupting chamber; at least two, first and second, electrodes the working surfaces whereof extend in the direction of stretching the arc, which electrodes are disposed in said arc interrupting chamber; a series blow-cut coil; a third electrode electrically connected to said first electrode of said interrupting chamber, made in the form of a split ring, said third electrode being an extension of said first electrode of said arc interrupting chamber and encompassing the latter over most of its perimeter; a fourth electrode made in the form of a solid ring, arranged coaxially with said third electrode; an annular gap formed by said third and fourth electrode; a portion of said gap in direct proximity to the free end of said third electrode, wherein a flashover occurs; said fourth electrode being electrically connected to said second electrode of said arc interrupting chamber so that the arc periodically appearing between said electrodes determines the moment at which active quenching of the arc starts at currents below a preset value.

3,883,775
GAS DISCHARGE DISPLAY SYSTEM WITH CURRENT SUPPRESSION MEANS

Willem Aling, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,586
Claims priority, application Netherlands, Jan. 8, 1973, 7300217
Int. Cl. H01j *17/48*
U.S. Cl. 315—84.6 **10 Claims**



1. A gas discharge display device comprising first and second groups of output transistors, first and second control circuits coupled to said first and second groups of output transistors, respectively, for controlling the conduction in said output transistors, a gas discharge display tube comprising a first electrode system arranged in a discharge space of the tube and having a plurality of electrodes coupled to output electrodes capacitively coupled via said capacitance means to necting further electrodes of said first group of output transistors to a terminal of an electric supply source, capacitance means, said display tube including a second electrode system arranged in the tube discharge space and having a plurality of electrodes capacitively coupled via said capacitance means to output electrodes of the second group of output transistors, means connecting further electrodes of said second group of output transistors to a point of substantially the same potential as the said supply source terminal, a switch coupled to the first control circuit for suppressing the current through the display device when the electrodes of the first electrode system are not energized, and means for coupling the output electrodes of the second group of output transistors through a load impedance means and said switch to a further terminal of the supply source.

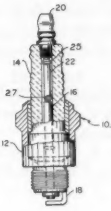
3,883,776
IGNITION CIRCUIT RADIATION SUPPRESSION STRUCTURE

Norman H. Berry, 49 Cambridge, Pleasant Ridge, Mich. 48069

Continuation-in-part of Ser. No. 226,042, Feb. 14, 1972, Pat. No. 3,771,006. This application Oct. 9, 1973, Ser. No. 404,170. The portion of the term of this patent subsequent to Nov. 6, 1990, has been disclaimed.

Int. Cl. H01t *13/04*

U.S. Cl. 315—85 **6 Claims**



1. An ignition circuit including a spark plug having a pair of lower spaced apart electrodes, a spark plug lead wire connected in series with the spaced apart electrodes of the spark plug, and a wire wound ignition circuit radiation suppression resistor connected in series with the series connected spark plug lead wire and electrodes of the spark plug and positioned closely adjacent the electrodes of the spark plug, which resistor has an inductance of between 10 and 800 microhenries and a resistance of between 15 and 30 ohms.

3,883,777
DEVICE FOR AUTOMATICALLY COMPENSATING FAILURE OF A LAMP

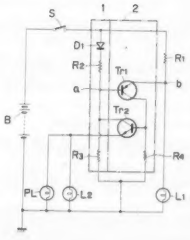
Masayuki Morita, Tokoname, Japan, assignor to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Aichi Prefecture, Japan

Filed Aug. 1, 1973, Ser. No. 384,533

Claims priority, application Japan, Aug. 2, 1972, 47-90364; Sept. 8, 1972, 47-104230

Int. Cl. H05b *39/10, 41/46*

U.S. Cl. 315—88 **9 Claims**



1. An apparatus for automatically detecting and compensating failure of a first lamp normally energizable from a power supply, comprising in combination:

means including a series resistor connecting said first lamp across said power supply and responsive to conduction through said first lamp for creating a voltage drop in said series resistor;

first and second normally non-conductive transistors of opposite polarity;

means connecting a main current electrode of said normally non-conductive first transistor between said first lamp and series resistor and responsive to loss of said voltage drop upon failure of said first lamp for turning on said first transistor;

bias means connecting the base of said first transistor to said power supply for enabling said main current electrode to control turn on of said first transistor;

means coupling said first transistor to the base of said second transistor and responsive to first transistor conduction for turning on said second transistor;

feedback means coupling a main current electrode of said second transistor to said bias means and responsive to conduction of said second transistor for increasing conductive bias on said first transistor base and accelerating switching of said first and second transistors into conduction; and

a back-up lamp and means coupling same to said second transistor and responsive to conduction of said second transistor for energizing said back-up lamp.

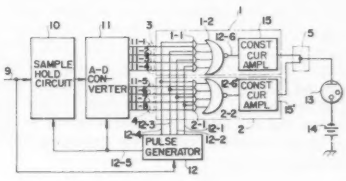
3,883,778
DRIVING APPARATUS FOR DISPLAY ELEMENT

Tetsunori Kaji, and Seiichi Murayama, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 3, 1973, Ser. No. 421,351

Int. Cl. H04n *5/66*

U.S. Cl. 315—205 **11 Claims**



1. An apparatus comprising:

a display element;

first means for quantizing input signals representing the degree of brightness to which said display element is to be energized;

second means for digitizing the output from said first means;

a plurality of first AND gates to one of whose input terminals signals corresponding to predetermined upper bits within the output signals from said second means are applied;

a plurality of second AND gates to one of whose input terminals signals corresponding to predetermined lower bits within the output signals from said second means are applied;

third means for generating pulse signals varying in width within a predetermined range;

fourth means for applying simultaneously said pulse signals in the increasing order of their pulse width to the other input terminals of said first and second AND gates;

first and second OR gates to which the output signals from said first and second AND gates are applied, respectively;

fifth and sixth means to which the output signals from first and second OR gates are applied, for respectively generating output signals having different respective amplitudes;

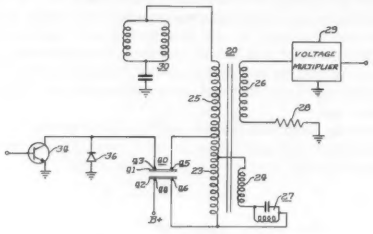
seventh means for adding the outputs from said fifth and sixth means, together; and

means for supplying the output of said seventh means to said display element.

3,883,779
FOUR-LEAD TUNING CAPACITOR FOR TELEVISION DEFLECTION SYSTEM

Terence J. Kiteley, Schaumburg, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed July 2, 1973, Ser. No. 375,585
Int. Cl. H01j *29/70*
U.S. Cl. 315—379 **4 Claims**

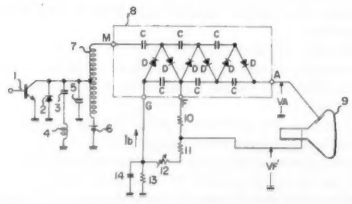


1. A television receiver including: a picture tube and associated deflection apparatus, said tube requiring a high DC potential; a tuned sweep transformer and a tuning capacitor supplying appropriate currents to said deflection apparatus; high voltage amplifying and rectifying means for producing said high DC potential from the output of said tuned sweep transformer, said transformer having an output voltage generating capability, in the event of failure occurring in said tuning capacitor, which is in excess of a predetermined safe level; and a source of B+ potential; said tuning capacitor including a pair of insulated foil electrodes, at least one of said foil electrodes being DC connected in the current path between said source of B+ potential and said transformer whereby in the event of failure of said capacitor, the voltage generated by said sweep transformer decreases.

3,883,780
CATHODE-RAY TUBE DRIVING SYSTEM

Teruhiro Tsukuda, Osaka; Noboru Yasumatsuya, Neyagawa; Takashi Tsutsumi, Takatsuki; Taiichi Saeki, Katano, and Yasuyoshi Hirai, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 21, 1972, Ser. No. 317,308
Claims priority, application Japan, Dec. 24, 1971, 47-218; Dec. 24, 1971, 47-219; Dec. 24, 1971, 47-220; Dec. 23, 1971, 47-504
Int. Cl. H01j *29/70*
U.S. Cl. 315—408 **9 Claims**

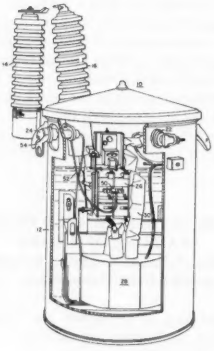


1. In a cathode-ray tube driving circuit which includes a horizontal deflection circuit having a flyback transformer generating flyback pulses, the improvement comprising:
a high-voltage rectifying and n-times multiplying circuit having a first input coupled to an output of said flyback transformer to rectify and boost the voltage of said flyback pulses, the nth output of said rectifying and multiplying circuit being coupled to the anode of said cathode-ray tube;
a parallel circuit comprising a resistance element and a capacitance element having a first common terminal connected to ground and a second common terminal connected to a second input terminal of said high voltage rectifying and multiplying circuit;
resistance means coupled between said second common parallel circuit terminal and a third terminal of said high voltage rectifying and multiplying circuit, the voltage at said third terminal being the flyback pulse input voltage multiplied and rectified m-times (where *m* and *n* are positive integers and *m* *n*); and
means coupling an intermediate tap of said resistance means to a focusing electrode of said cathode ray tube for applying a voltage derived from said resistance means to said focusing electrode.

3,883,781
REMOTE CONTROLLED CIRCUIT INTERRUPTER

John F. Cotton, Athens, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 6, 1973, Ser. No. 394,906
Int. Cl. H01h *37/00*
U.S. Cl. 317—14 R **32 Claims**



1. A circuit breaker comprising:
a stationary contact;
a movable contact;
an elongated contact arm carrying said movable contact at one end thereof;
a primary latch supported for movement about a first axis and being in a latching position, latching the other end of said elongated contact arm;
a second latch in a latched position;
biasing means biasing said second latch toward a tripping position;
a bimetal actuated latch latching said second latch in the latched position;
a spring operating mechanism pivotally connected to said contact arm intermediate the end of said contact arm and being operable to pivot said contact arm about said other end on said primary latch between open and closed positions with a snap action;
a signal latch in a latched position;
said bimetal actuated latch latching said signal latch in the latched position;
a pair of signal contacts associated with said signal latch and being movable from an open to a closed position when said signal latch is released;
said bimetal actuated latch being responsive to current flowing through the circuit breaker so upon the occurrence of lesser overloads above a predetermined value,

said bimetal actuated latch releases said signal latch, whereupon said pair of signal contacts moves to a closed position and upon the occurrence of a greater overload above a predetermined value, said bimetal actuated latch also releases said second latch, whereupon said biasing means moves said second latch to effect movement of said primary latch to unlatch said elongated contact arm, whereupon said spring operating mechanism moves said contact arm to a tripped open position; and,

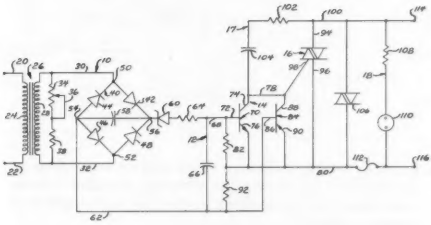
signal reset means being responsive to an electric signal to reset said signal latch in a latch position.

3,883,782

OVERCURRENT RELAY CIRCUIT

Robert W. Beckwith, 1002 Greenfield Ln., Mount Prospect, Ill. 60056

Filed May 31, 1974, Ser. No. 474,874
Int. Cl. H02h *3/10*
U.S. Cl. 317—16 **19 Claims**



1. An electric circuit for use in controlling an electric current, comprising: means for receiving a sensed current; shorting means connected to the means for receiving the sensed current, said shorting means being responsive to an electrical condition of the sensed current; solid-state bi-directional switching means having a pair of main terminals and a gate, said shorting means being connected between one of said main terminals and the gate of the solid-state bi-directional switching means, said shorting means controlling said solid-state bi-directional switching means; capacitive means connected between the gate and the other of said main terminals of said solid-state bi-directional switching means, said capacitive means coupling transients from the other of said main terminals to the gate of the solid-state bi-directional switching means to maintain a conducting state through the solid-state bi-directional switching means during change in direction of the current between the main terminals; and means for connecting the solid-state bi-directional switching means to the electric current to be controlled.

3,883,783

ELECTRONIC COMPONENT POSITIONER FOR LOADER VEHICLES AND THE LIKE

Joe E. Fuzzell, Peoria, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Division of Ser. No. 287,604, Sept. 11, 1972, Pat. No. 3,782,248. This application Nov. 2, 1973, Ser. No. 412,208
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 R **3 Claims**

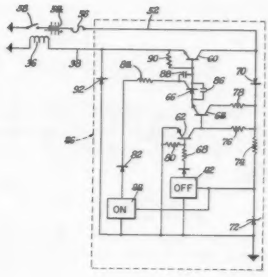
1. A logic control circuit for energizing and deenergizing a selected device via a given voltage source, said logic control circuit comprising:

a conductive device;

circuit means operatively associated with said conductive device and adapted to couple said selected device to said voltage source in response to conduction through said conductive device and to uncouple said selected device from said voltage source upon termination of conduction through said conduction device;

first and second sequentially operable triggering means having a sequence of operations that after termination of said first triggering means said second triggering means operates and terminates and then operates and terminates again and then said first triggering means operates;

means responsive to operation of said first triggering means for rendering said conductive device nonconductive during operation of said first triggering means and for conditioning said conductive device for conduction after termination of operation of said first triggering means;



means responsive to operation of said second triggering means for initiating conduction through said conductive device during operation of said second triggering means and for maintaining conduction through said conductive device until a subsequent operation of said first triggering means.

3,883,784

ELECTRICAL DEVICE WITH HIGH DIELECTRIC CONSTANT

Robert L. Peck, Wilimantic; Jefferey B. Otto, Brooklyn, and Alexandra G. Pappajtion, Danielson, all of Conn., assignors to Robert L. Peck, Willimantic, Conn.

Continuation of Ser. No. 226,429, Feb. 15, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 395,611
Int. Cl. H01g *3/06*
U.S. Cl. 317—258 **13 Claims**

1. An electrical device including as assembled parts:

a pair of conductive elements; and

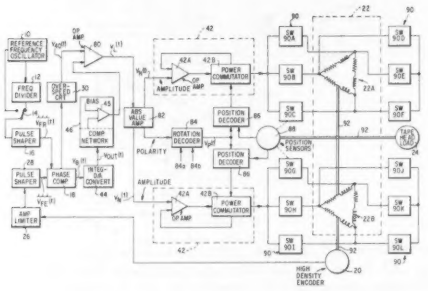
a solid polymeric association product between said conductive elements, said polymeric association product being characterized by a multiplicity of ionic donors or interstitial impurities which act as ionic donors and a multiplicity of ionic acceptors, said polymeric association product having a dielectric constant of at least 10 at room temperature and at a frequency between 120hz and 1,000hz.

3,883,785

LOW SPEED PHASELOCK SPEED CONTROL SYSTEM

Robert W. Fulcher, College Park, and John Sudey, Timonium, both of Md., assignors to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Sept. 27, 1973, Ser. No. 401,466
Int. Cl. H02p *5/00*
U.S. Cl. 318—314 **7 Claims**



1. In combination, a brushless D.C. motor and motor speed control system for controlling the speed of said motor, said system comprising:

means for generating a reference frequency signal; sensor means responsive to the motor for producing angular position signals and including an output signal having a frequency in accordance with the speed of the motor;

phase comparator means for comparing the reference frequency signal with the sensor output signal and for producing an output pulse train in which each pulse thereof is determined in accordance with the difference in frequency and phase between the reference frequency signal and the sensor output signal;

integrator-digital-to-analog converter means for converting the output of said phase comparator into an analog error signal voltage,

biasing means for converting said analog error signal voltage to a bi-directional error signal voltages; and means responsive to the bi-directional error signal voltage of said biasing means for controlling acceleration or deceleration of said motor to achieve symmetrical bi-directional torque control thereof.

3,883,786

PULSE WIDTH MODULATED SERVO SYSTEM

Lawrence S. McNaughton, Stuarts Draft; John M. Rhoades; Irvin L. Erler, both of Waynesboro, all of Va., and Kenneth M. Watkins, Fairview, Pa., assignors to General Electric Company, Salem, Va.

Filed Oct. 12, 1973, Ser. No. 405,936
Int. Cl. H02h *7/08*
U.S. Cl. 318—317 **20 Claims**

1. a circuit for driving a d-c motor from a d-c voltage source in response to a commanded velocity signal comprising:

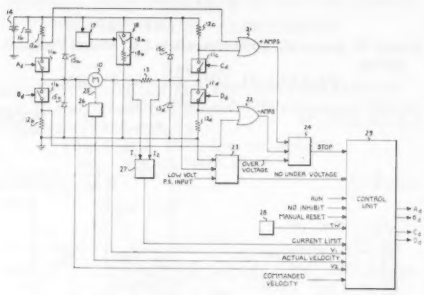
a. four switch elements connected to form a bridge, the motor being connected across one diagonal of the bridge and the d-c voltage source being connected across the other diagonal of the bridge so that when one pair of diagonally opposed switches is closed the voltage source will drive current through the motor in one direction and when the other pair of diagonally opposed switches is closed the voltage source will drive current through the motor in the other direction;

b. four diodes, each diode being connected in parallel with one of the switch elements and poled to conduct current into the positive terminal of the voltage source;

c. means for generating a signal proportional to the actual velocity of the motor;

d. current sensing means responsive to the motor armature current for generating a current limit signal having a first signal level when the motor armature current is less than a selected value and having a good signal level when the motor armature current is greater then the selected value;

e. a summing amplifier responsive to the commanded velocity signal and to the actual velocity signal for generating a velocity error signal that is proportional to the difference between the commanded velocity signal and the actual velocity signal;



f. a circuit means responsive to the current sensing means second level for causing the summing amplifier velocity error signal to be modified so that the motor armature current is limited;

g. switch control means responsive to the velocity error for operating the switch elements, the polarity of the velocity error signal determining which switch elements are to be closed and the magnitude of the velocity error signal determining the duration said switch elements are closed, said motor drive circuit operating to make the actual velocity of the motor equal the commanded velocity.

3,883,787

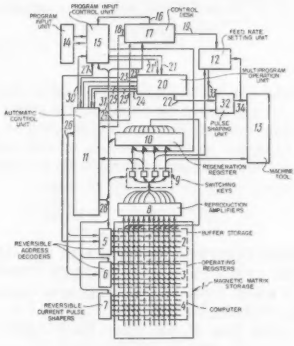
DEVICE FOR NUMERICAL PROGRAMMED CONTROL

Alexei Pavlovich Guldenbalk, ulitsa Kalgaeva 3, kv. 19, Leningrad; Vitaly Ivanovich Ivchenko, Furmanny pereulok 7, kv. 8; Teodor Iosifovich Kazakevich, 6 Novopodmaskovny pereulok, 10, kv. 28, both of Moscow; Leonid Pavlovich Koslov, prospekt Shvernika 47, kv. 49, Leningrad; Vladimir Grigorievich Kolosov, prospekt Shvernika 47, kv. 48, Leningrad; Ninel Iosifovna Kolosova, prospekt Marisa Toreza, 40, korpus 1, kv. 152, Leningrad; Viktor Fedorovich Melekhin, prospekt Nauki, 12, Korpus 6, kv. 87, Leningrad; Leonid Semenovich Popandopulo, Lodochnaya ulitsa 29, kv. 138, Moscow; Sergei Leonidovich Chechurin, ulitsa Manchesterskaya, 12 kv. 29, Leningrad; Pavel Sergeevich Ivanov, Bulvarnaya ulitsa, 89, kv. 22, Leningrad; Vyacheslav Semenovich Korolev, ulitsa Ushinskogo, 18, kv. 111, Leningrad; Vadim Nikolaevich Kushinikov, ulitsa Sedova, 140, kv. 27, Leningrad; Vladimir Fedorovich Sokolov, ulitsa Pulkovskaya, 25, kv. 62, Moscow, and Vyacheslav Anatolievich Chiganov, ulitsa Mira 21, kv. 10, Leningrad, all of U.S.S.R.

Filed July 26, 1973, Ser. No. 383,305
Int. Cl. G05b *19/18*
U.S. Cl. 318—569 **2 Claims**

1. A device for numerical programmed control of relative movement of a tool and a workpiece along an outline in an industrial plant equipped with an automatic processing machine-tool, comprising: a control desk; an automatic control unit having inputs and outputs; a program input control unit connected to said control desk and to said automatic control unit and having an output; a program input unit connected to said program input control unit, a feed rate setting unit connected to said control desk and having an output, a pulse

shaping unit for the shaping of pulses corresponding to elementary movements, said pulse shaping unit being connected to said automatic control unit, to said processing automatic machine-tool, and to said feed rate setting unit, reversible address decoders having address write inputs, reversible current pulse shapers, reproduction amplifiers, switching keys for the switching of output signals of the reproduction amplifiers, regeneration registers, operating registers, a buffer storage and a computer; said operating registers, buffer storage and computer forming a common magnetic matrix storage including common digit buses and three groups of address buses; two fo said groups of the address buses of said matrix storage corresponding to said buffer storage and to said operating registers, said third group of the address buses corresponding to said computer and being, via said reversible current pulse shapers, connected to said outputs of said automatic control unit corresponding to the readout of said reversible address decoders and reversible current pulse shapers; said write inputs of said reversible address decoder of the buffer storage being connected to said outputs of said automatic control unit and program input control unit respectively, said write address



inputs of said reversible address decoder of the operating registers being connected to said outputs of said automatic control unit; said common digit buses of said matrix storage being connected, via said reproduction amplifiers and switching keys of output signals of the reproduction amplifiers, to said regeneration register, automatic control unit, feed rate setting unit and processing machine-tool; and a multiprogram operation unit including inputs corresponding to interrogations for performing one of the programs and outputs corresponding to the beginning of one of the programs; there being connected to said inputs corresponding to the interrogations for performing one of the program an output of said program input control unit, an output of said feed rate setting unit and outputs of said automatic control unit, there being connected to said start input of said multiprogram operation unit an output of said automatic control unit, a signal indicating the availability of said computer for executing the next program appearing at said output of said automatic control unit, said outputs of said multiprogram operation unit corresponding to the beginning of one of the programs being connected to the start inputs of said automatic control unit.

3,883,788

GYROSCOPE ORIENTATION CONTROLLER

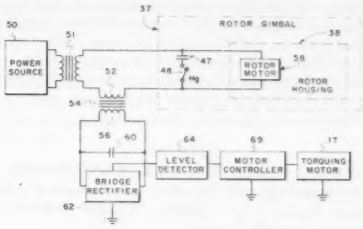
Roy E. Storey, Jr., Rosenberg, Tex., assignor to Sperry-Sun Well Surveying Company, Sugar Land, Tex.

Filed Oct. 26, 1973, Ser. No. 409,850

Int. Cl. G05b *11/12, 17/00, 11/01;* **B64c** *17/02*

U.S. Cl. 318—648 **23 Claims**

1. In a gyroscope for use in a borehole survey instrument, a rotor orienting system, comprising: means for providing to the gyroscope rotor motor a power signal having an impulse characteristic; means for producing a ringing characteristic in the power signal; means for varying the state of a parameter



of the ringing characteristic; means for detecting the state of the parameter; and means for orienting the rotor in response to the state of the parameter of the ringing characteristic.

3,883,789

POWER PACK

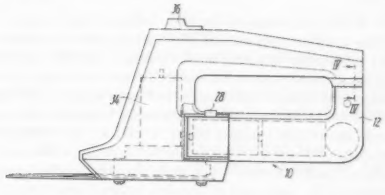
Dieter Achenbach, Betzdorf, Sieg; Siegfried Adolf Joswig, Kausen b. Betzdorf, and Walter Kolb, Betzdorf, Sieg, all of Germany, assignors to Wolf-Gerate GmbH, Betzdorf, Germany

Filed Mar. 19, 1974, Ser. No. 452,634

Claims priority, application Germany, June 8, 1973, 2329415

Int. Cl. H01m *45/00*

U.S. Cl. 320—2 **4 Claims**



1. A power pack for use with a hand tool comprising a housing, an electric motor positioned within the forward end of said housing; a reciprocating tool assembly extending from the forward end of said housing and being coupled for operation to said motor; an integral handle portion extending rearwardly from the rear upper portion of said housing; the rearmost free end of said handle having a downwardly facing groove defined by a pair of spaced surfaces;

the lower rear portion of said tool housing having a hollow rearwardly facing collar;

first electrical contact means along one interior surface of said collar; one wall of said collar having an opening;

said power pack comprising:

an L-shaped housing;

a plurality of batteries in said L-shaped housing;

means in said L-shaped housing for electrically connecting said batteries;

one limb of said L-shaped housing having a configuration conforming to the shape of the hollow limb receiving collar provided at the lower rear end of said tool housing; said one limb being adapted to be slidably inserted into said hollow collar;

second electrical contact means along one exterior portion of said one limb and means for connecting said second contact means to said batteries; said second contact means slidably engaging said first contact means when said one limb is inserted into said collar;

the remaining limb of said L-shaped housing having a T-shaped projection for slidably engaging the facing edges

of said spaced surfaces when said one limb is inserted into said hollow collar;

said one limb having a locking projection, biasing means for urging said locking projection outwardly and into said collar opening to lock said L-shaped housing in said collar when said one limb is inserted into said hollow collar;

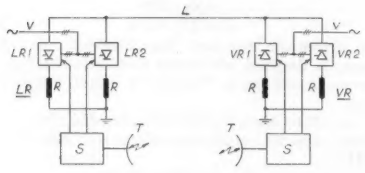
said tool housing handle and said L-shaped housing collectively defining a large opening for receiving the operator's hand to facilitate gripping of the tool.

3,883,790

DIRECT CURRENT POWER TRANSMISSION

Bertil Hammarlund, and Lars-Erik Juhlin, both of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 8, 1974, Ser. No. 440,873
Claims priority, application Sweden, Feb. 14, 1973, 02049
Int. Cl. H02j *3/36*
U.S. Cl. 321—2 **7 Claims**



1. Power transmission for high voltage direct current comprising a direct current line (L) and convertor stations (LR, VR) connected thereto, each convertor station including a current control system, at least one station being a rectifier station and at least one station being an inverter station, the convertors in the inverter station being inverters, the convertors in the rectifier station being rectifiers, alternating current networks (V) at least one connected to each of said convertor stations, each convertor station comprising at least two convertors (**1, 2**) connected in parallel, each control system (**6–8**) including means to set the total current of the station as well as the current in the individual convertors in agreement with a predetermined current order (**9**), a telecommunication means (T) between said convertor stations for coordinating the total current of the stations, means for replacing said telecommunication line in case of a fault in it, said means comprising in each convertor station a means (**11**) to sense at least one of the magnitudes current or voltage on the d.c. line, means connected to said sensing means and to the current control system (**8**) of the station to reduce the current order set in the station in response to a sudden interference in at least one of the magnitudes current or voltage, and, in the inverter station, means (**32, 42**) responsive to current disappearance in one of the inverters of the station to reduce temporarily the internal direct voltage of the other inverter to approximately zero.

3,883,791

THREE PHASE SEQUENCE INSENSITIVE FULL RANGE SCR FIRING CIRCUIT

William B. Zelina, Edinboro, and Joseph M. Allison, Wesleyville, both of Pa., assignors to McGraw-Edison, Elgin, Ill.

Filed Mar. 15, 1974, Ser. No. 451,687
Int. Cl. H02m *7/20*
U.S. Cl. 321—5 **9 Claims**

1. A three phase, sequence insensitive, full range SCR firing circuit comprising

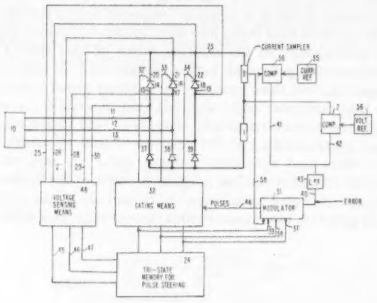
a three phase power supply comprising three SCRs each having anodes, cathodes, and gates,

the cathodes of said SCRs being connected to an output line,

power lines connected to said anodes,

gating means connected to said gates,

a tri-state memory means connected to said gating means, said tri-state memory being adapted to follow said power supply phase sequence,



and a modulator means connected to said tri-state memory means for generating the pulse for said gating means,

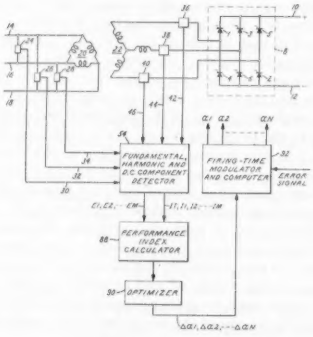
said tri-state memory means being adapted to steer said pulse from said modulator means to said gates of said SCRs whereby the output of said SCRs is controlled over substantially a full range of power output.

3,883,792

OPTIMUM CONTROL SYSTEM FOR MINIMIZING HARMONIC EFFECTS IN HVDC POWER CONVERTERS

Frederick J. Ellert, Broomall, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed June 28, 1973, Ser. No. 374,682
Int. Cl. H02m *1/12*
U.S. Cl. 321—9 R **10 Claims**



1. In a system for controlling HVDC power converters connected to alternating voltage electric power lines, the HVDC converters comprising a plurality of controllable electric current conducting valves arranged to be periodically fired in a predetermined sequence in timed relation to the alternating voltage cycle, the firing angles at which said valves respectively are switched from nonconducting to conducting states being controllable, the alternating voltage on said lines having a certain fundamental frequency and a plurality of harmonic components which occur therein due to the switching action of said valves, the improvement comprising:

a. detecting means for detecting said harmonic components of the alternating voltage on said lines and for providing an electrical representation of the magnitude of each of said harmonic components,
b. calculating means responsive to said electrical representations for calculating performance indexes representing the degree of undesirability of a certain intensity of harmonic component occurrence, and
c. control means responsive to said performance indexes operating to vary the relative firing angles of the respective ones of said valves for changing the value of said performance indexes toward an optimum value,

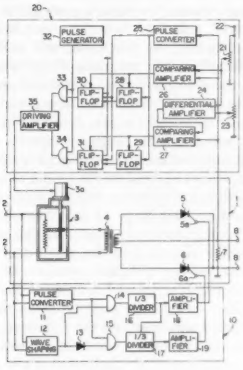
thereby minimizing the undesirable effects of said harmonic component occurrence.

3,883,793

POWER SUPPLY SYSTEM FOR ELECTROLYTIC GRINDING APPARATUS

Yasushi Mizuhara, Kamakura, and Yasuo Suzuki, Yokohama, all of Japan, assignors to Hitachi Seiko Ltd., Japan

Filed July 27, 1973, Ser. No. 383,050
Claims priority, application Japan, July 31, 1972, 47-76001
Int. Cl. B23p *1/04*
U.S. Cl. 321—18 **7 Claims**



1. A power supply system for an electrolytic grinding apparatus comprising:

a power supply circuit for lowering an a.c. voltage of a commercial frequency to a working voltage level and rectifying the lowered voltage to obtain a d.c. voltage having a pulsating waveform as an output, which constitutes the working voltage;

a phase reducing circuit for setting the repetition frequency of said d.c. output voltage waveform in synchronism with said a.c. voltage; and

a voltage control circuit for comparing said d.c. output voltage with a predetermined reference voltage and controlling the peak value of said d.c. output voltage to a predetermined level.

3,883,794

ELECTRICAL POWER GENERATING APPARATUS

Theodore Edward Sivley, Mountain View, Calif., assignor to Whamco, Mtn. View, Calif.

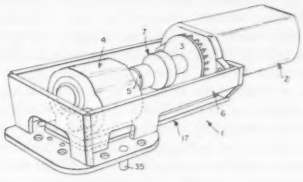
Filed Dec. 26, 1972, Ser. No. 317,922
Int. Cl. B60k *17/28;* **H02p** *15/00*
U.S. Cl. 322—41 **4 Claims**

1. An assembly for producing electrical energy in an automotive vehicle having a transmission comprising:

a source of electrical energy having an armature shaft;

a gear assembly having an input shaft and an output shaft;

a means for frictionally coupling said armature shaft of said energy source and said output shaft of said gear assembly, said coupling means having a first means coupled to said armature shaft and a second means coupled to said output shaft, said first and said second means having facing surfaces which slip relative to each other for permitting relative rotation betwen said armature shaft and said output shaft in response to a predetermined force; and



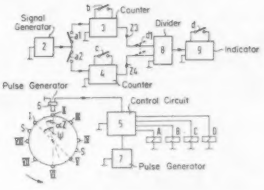
a relatively rigid housing having a base portion with a substantially vertical flange portion attached thereto, said source mounted on said flange portion and said gear assembly mounted on said base portion, for receiving said source and said gear assembly, said housing including means for maintaining said armature shaft in substantial coaxial alignment with said output shaft, a means for mounting said housing to a transmission in a vehicle, and a means for coupling said input shaft of said gear assembly to said transmission.

3,883,795

ELECTRONIC IGNITION ANGLE MEASURING APPARATUS

Erwin Klein, and Herbert Lucke, both of Regensburg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 14, 1973, Ser. No. 341,141
Claims priority, application Germany, Mar. 16, 1972, 2212813
Int. Cl. F02p *17/00*
U.S. Cl. 324—16 R **5 Claims**



1. An electronic ignition angle measuring apparatus for an internal combustion engine including a first pulse generator coupled to the distributor of the engine for generating ignition pulses, and a second pulse generator for generating pulses at a frequency which depends upon the speed of rotation of the engine and in a predetermined phase relationship with respect to top dead center of the cylinders of the engine comprising:

signal generating means;

first and second signal summing means each comprising an analog integrator, coupled and responsive to said signal generating means;

control means including a logic control circuit, coupled to said signal generating means, said first and second summing means, and to the first and second pulse generators, and responsive to a first pulse signal generated by said second pulse generator prior to the generation of an

ignition pulse by said first pulse generator so as to activate one of said summing means, to said ignition pulse generated subsequent to the generation of said first pulse signal so as to activate the other of said summing means, and to a second pulse signal generated by said second pulse generator subsequent to the generation of said first pulse signal within one revolution of the engine crankshaft from the generation of said first pulse signal so as to deactivate both of said first and second summing means, said integrators summing signals transmitted thereto by said signal generating means and said control means, and said control means controlling said summing of said signals;

signal dividing means, coupled to said first and second summing means, for generating a signal representative of the ignition angle measured, and including a first integrator coupled to one of said first and second summing means, a comparator coupled to said first integrator and to the other one of said first and second summing means, a second integrator, coupled to said signal generating means and to said indicating means, first switching means coupled to said first and second integrators and said logic control circuit, and second switching means coupled to said signal generating means and said second integrator and responsive to said comparator;

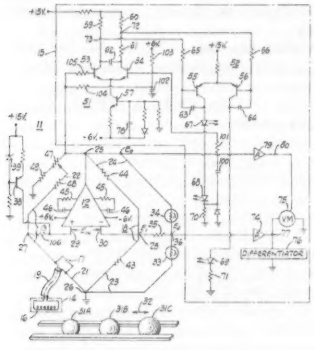
means, coupled to said signal dividing means, and responsive to the signal generated thereby, for indicating the ignition angle measured.

3,883,796

PROXIMITY PROBE WITH OUTPUT PROPORTIONAL TO TARGET DISTANCE

Frederick R. Holt, Cleveland, and Noah Flueckiger, Solon, both of Ohio, assignors to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Sept. 5, 1972, Ser. No. 286,276
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 PS **13 Claims**



1. A proximity probe circuit, comprising in combination,

an amplifier having an output and an input,

feedback means connecting said amplifier output to said amplifier input,

a proximity probe,

means connecting said probe as part of said feedback means to produce a signal at said input of said amplifier which is gradually variable in accordance with the change of distance from said probe to a conductive target,

a bridge circuit having arms as part of said feedback means, variable means in said feedback means and included in two of said arms of said bridge circuit,

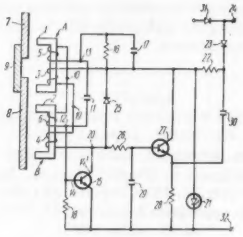
and output means connected to said amplifier and including means controlling said variable means in accordance with said amplifier output to decrease the input signal to said amplifier upon an increase of amplifier output.

3,883,797

APPARATUS FOR CHECKING THE CONTINUITY OF METALLIC PIPES USING AN OSCILLATOR WHOSE FREQUENCY CHANGES AT DISCONTINUITIES

Abram Lvovich Abrukin, Vorobievskoe shosse, 11, kv. 5, Moscow, U.S.S.R.

Filed June 20, 1974, Ser. No. 481,404
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 **2 Claims**



1. An apparatus for checking-up the continuity of metallic pipes comprising: means for inducing magnetic field in the pipe being checked, said field being changed upon the occurence of a discontinuity in said pipe, and a converter for converting a change in the magnetic field into an electric signal carrying the information on the discontinuity of said pipe, said means and said converter comprising two transformers with open magnetic circuits mounted in a fixed position relative to each other, the magnetic circuits of said transformers being completed during the checking-up by the body of the pipe being checked, and an electronic amplifier circuit with positive feedback formed by the windings of said transformers, the primary windings of said transformers being matchingly interconnected and coupled to the output of said electronic amplifier circuit, and the secondary windings of said transformers having different number of turns being oppositely connected in series and coupled to the input of said electronic amplifier circuit, the ratio between the number of turns of said primary windings and the difference in the number of turns of said secondary windings complying with the condition

$K\beta > 1$ wherein K is gain of said electronic amplifier circuit, and β is resultant transformation ratio of the system of the interconnected transformers, whereby, upon the occurence of a discontinuity in the pipe being checked, the frequency of the electric signal at the output of said electronic amplifier circuit is changed.

3,883,798

FREE FLOW RESONANT CAVITY MEASURING APPARATUS

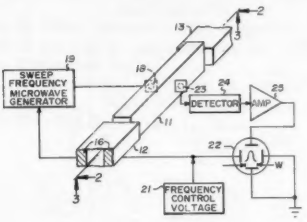
John Marshall Free, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 250,301, May 4, 1972, abandoned. This application Apr. 19, 1974, Ser. No. 462,467
Int. Cl. G01r *27/04*
U.S. Cl. 324—58.5 C **8 Claims**

1. A system in which microwave techniques are applied to a solid particulate medium having continuous flow in the system for exposing the medium to resonant electromagnetic energy comprising:

wave guide means for defining a substantially uniformed cross-sectioned continuous feed path including resonant cavity means and end pipe means at opposite ends of the resonant cavity means, each end pipe means being arranged relative to said resonant cavity means to electri-

cally close one end of the resonant cavity means while maintaining said feed path mechanically unobstructed; and



means coupled with said end pipe means for continuously maintaining said resonant cavity means filled with said medium.

3,883,799

METHOD FOR STABILIZING CONDUCTANCE OF CONVERSION OF MECHANICAL DISPLACEMENTS INTO ELECTRIC SIGNAL OF CAPACITANCE TRANSDUCER AND DEVICE FOR EFFECTING SAME

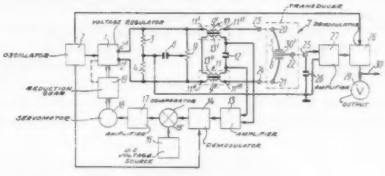
Lev Petrovich Ulyanov, Eropkinsky pereulok, 7, kv. 6, Moscow, U.S.S.R.

Filed Dec. 28, 1973, Ser. No. 429,398

Claims priority, application U.S.S.R., Dec. 29, 1972, 1860251; Dec. 29, 1972, 1860252

Int. Cl. G01r *27/26*

U.S. Cl. 324—61 R **2 Claims**



1. A method for stabilizing the conductance of conversion of mechanical displacements into an electric signal of a capacitance transducer having two capacitors incorporated into a bridge circuit, consisting in shunting the output of said capacitance transducer, continuously measuring the total current of said two capacitors of said capacitance transducer, controlling the supply voltage of the capacitance transducer and stabilizing said total current, which is being measured, of said two capacitors of said capacitance transducer.

3,883,800

CAPACITIVE SENSOR POSITION DETECTING SYSTEMS FOR MAGNETIC TAPES AND THE LIKE

Jean G. Dupont, L'Hay-les-Roses, France, assignor to Compagnie Internationale pour l'Informatique, Louveciennes, France

Filed Jan. 8, 1974, Ser. No. 431,764

Claims priority, application France, Jan. 8, 1973, 73.00443

Int. Cl. G01r *27/26*

U.S. Cl. 324—61 R **10 Claims**

10. In a capacitive position sensing system for permanently measuring the position within a hollow duct of an end loop of a conducting tape the electrical linear resistance of which may have a range of from about 0.5 ohm to about 1,000 megohms, the combination comprising:

said duct;

a plurality of metallized electrodes applied along one wall of the duct along which the said end loop is displaced;

a further metallizated electrode surrounding the said plurality of electrodes,

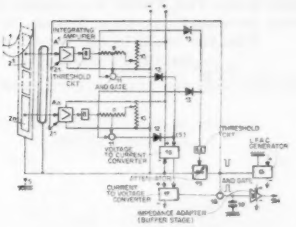
means applying an A.C. voltage of rectangular waveform to the said further electrode;

a plurality of integrating operational amplifiers equal to the number of said plurality of metallized electrodes, each having an input connected to a corresponding one of said plurality of electrodes;

a plurality of threshold circuits one connected respectively to the output of each said amplifier;

a plurality of AND gates each having one input respectively connected directly to the output of one of said threshold circuits;

a plurality of adjustable voltage circuits one also connected to the output of one of said threshold circuits respectively



and each having an output tap connected to the other input of one of said AND gates respectively, said adjustable voltage circuits being adjusted to add to the output voltage of its respective threshold circuit, a constant bias which is progressively increased from each circuit to the next; and

a logical-OR circuit having as many inputs as are outputs of the said AND-gates;

said means applying said A.C. voltage of rectangular waveform to said further electrode providing a complete charge within an alternation of a single polarity of said waveform of any condenser comprised by said further electrode, each one of the said metallized electrodes of the plurality and that part of the tape facing any one of the said electrodes of the plurality.

3,883,801

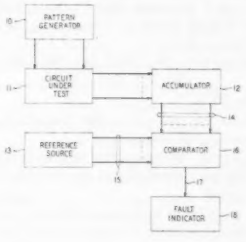
FAULT TESTING OF LOGIC CIRCUITS

Garry Carson Hess, Champaign, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 7, 1973, Ser. No. 413,674

Int. Cl. G01r *15/12*

U.S. Cl. 324—73 R **11 Claims**



1. A logic circuit tester of the type in which a sequence of input vectors activates a logic circuit under test to yield a corresponding sequence of output vectors, said tester comprising:

an accumulator for summing the sequence of output vectors from the logic circuit under test into a single characterizing test sum vector,

means for adding the overflow bit of said accumulator to the least significant input bit thereof,

a reference source providing a reference sum vector characterizing a properly functioning logic circuit of the type under test, and

a comparator responsive jointly to the respective test and reference sum vectors for indicating the state of correspondence thereof and hence the state of operativeness of the logic circuit under test.

3,883,802

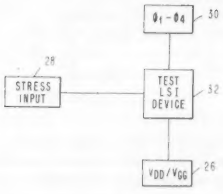
PROCESS FOR STRESS TESTING FET GATES WITHOUT THE USE OF TEST PATTERNS

Yogishwar Kumar Puri, Vienna, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1973, Ser. No. 425,042

Int. Cl. G01r *31/26*

U.S. Cl. 324—73 R **7 Claims**



1. In a testing process for dynamic, random logic FET circuit arrays without the use of test patterns comprising the steps of

a. providing a plurality of clock phases to each dynamic, random logic FET circuit in an array under test, the clock phases having a prescribed time relation to one another to transfer information through the array of logic circuits,

b. providing operating potentials to each random logic FET circuit under test,

c. providing an initial stress voltage to each random logic FET circuit in the array adapted to receive a data input,

d. and cycling the clock phases in reverse order to the prescribed time relation for transferring information through the array of logic circuits.

3,883,803

NON-COHERENT MULTI-CHANNEL OPTICAL SPECTRUM ANALYZER

Philip J. Donald, Woodbury, N.J.; George W. Hunka, Churchville, and Jack J. Rudnick, Bala Cynwyd, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 26, 1968, Ser. No. 709,860

Int. Cl. G01r *23/18*

U.S. Cl. 324—77 K **4 Claims**

1. Apparatus for analyzing the frequency content of an electrical input signal comprising:

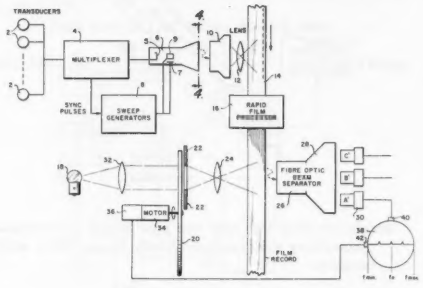
electronic display means connected to said input signal for converting said input signal into an intensity modulated optical signal;

means for projecting said optical signal;

movable photo-sensitive recording means for recording said projected optical signals at a preselected speed for providing a time base for said recording;

means for generating a plurality of optical reference signals, each of said optical reference signals being representative of a different particular frequency within a preselected frequency band;

means for comparing the frequency of said optical signal with said reference signals;



means responsive to said comparison means for detecting coincidence of frequency of said optical signal with the frequency of any of said reference signals; and

means for determining the frequency of the reference signals coinciding with said optical signals.

3,883,804

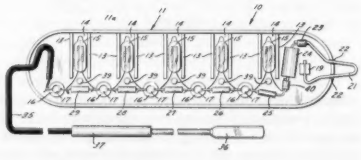
ELECTRICAL FENCE-TESTER HAVING A PLURALITY OF CONNECTORS FOR CONNECTING THE TESTER COMPONENTS

Robert M. Wilson, Battle Creek, Mich., assignor to Dare Products, Incorporated, Battle Creek, Mich.

Filed Apr. 16, 1973, Ser. No. 351,798

Int. Cl. G01r *19/16;* **H01r** *9/00, 13/46*

U.S. Cl. 324—122 **5 Claims**



1. An electrical fence tester comprising:

A. a container,

B. a cover adapted to be mounted on said container and to be affixed thereto,

C. an electrical circuit comprising:

1. a plurality of resistors connected in series, the values of said resistors decreasing from one end to the other,

2. a plurality of glow lamps one connected across each of said resistors,

3. a plurality of electrical connectors connecting the respective leads of said glow lamps and said resistors to each other, each connector comprising:

a. a pillar integrally molded to said container having non-threaded axial channel and having an open transverse slot provided at the end of said pillar and communicating with said axial channel, and

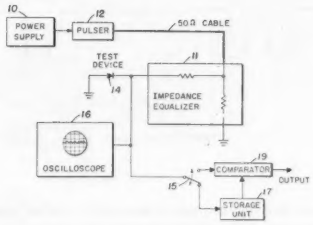
b. a protuberance axially slidably disposed in said axial channel in contact engagement with the walls of said axial channel engaging and maintaining the electrical leads from said glow lamps and said resistors in electrical contact,

4. external terminals connected to said circuit.

3,883,805
DETERMINATION OF THE SUSCEPTIBILITY OF SEMICONDUCTOR DEVICES TO THERMAL SECOND BREAKDOWN

Norman S. Cohn, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 7, 1974, Ser. No. 449,187
Int. Cl. G01r *31/26*
U.S. Cl. 324—158 D **4 Claims**



1. A method of determining the susceptibility of a semiconductor device to thermal second breakdown comprising the steps of:

measuring magnitudes of voltage rise factors for a set of preliminary test devices;

measuring magnitudes of damage resistance factors for said set of preliminary test devices;

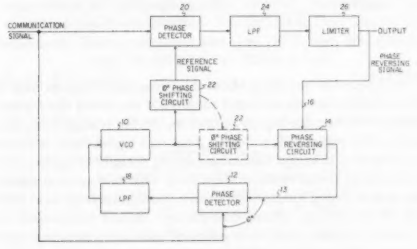
measuring a magnitude of a voltage rise factor for said semiconductor device;

comparing said magnitude of said voltage rise factor of said semiconductor device to said magnitudes of said set of preliminary test devices to select the damage resistance factor of said semiconductor device from corresponding magnitudes of said compared voltage rise factors thereby indicating the susceptibility of said semiconductor device.

3,883,806
DEMODULATOR CIRCUIT FOR PHASE MODULATED COMMUNICATION SIGNALS

Vincent R. DeLong, Marion, and Robert L. Craiglow, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, Dallas, Tex.

Filed Mar. 7, 1974, Ser. No. 449,158
Int. Cl. H03d *3/00*
U.S. Cl. 325—320 **4 Claims**



1. A demodulator circuit for providing a local reference signal for coherently demodulating communication signals containing phase modulation in the form of phase reversals in the carrier signal, comprising:

a voltage controlled oscillator for phase locked loop operation;

phase shifting circuit means for providing a reference signal which is out of phase with the output of said voltage controlled oscillator by the same amount and in a direction opposite to the phase shift produced by phase locked loop operation;

first detector circuit means for providing a bilevel phase reversing signal which constitutes the demodulated output whose level is dependent on the phase difference between the communication and reference signals;

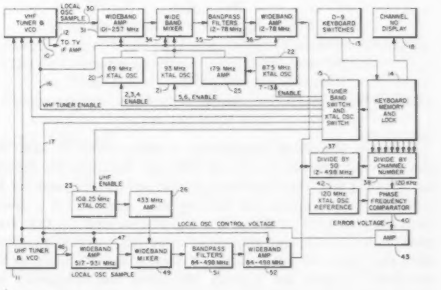
phase reversing circuit means for providing a signal at its output which is 0° or 180° out-of-phase with the output of said voltage controlled oscillator, the phase shift being dependent on the level of said phase reversing signal; and

second detector circuit means for applying to said voltage controlled oscillator a control signal which is indicative of the phase difference between the communication signal and the output of said phase reversing circuit means.

3,883,807
TUNING CONTROL SYSTEM

Jade H. Alberkrack, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed May 30, 1974, Ser. No. 474,665
Int. Cl. H04b *1/26*
U.S. Cl. 325—420 **15 Claims**



1. A tuning control system for a wave signal receiver capable of receiving signals in a plurality of frequency bands and having local oscillator means tunable to different transmitted signals in such bands in response to a tuning control signal, said tuning control system including in combination:

mixer means having an output and at least first and second input;

means for applying output signals from the local oscillator means to at least a first input of said mixer means;

first and second gated offset oscillator means enabled for operation by an enabling gating signal and each producing output signals on an output terminal thereof at a different frequency having a predetermined relationship with a different frequency band which the wave signal receiver is capable of receiving, the outputs of said first and second gated offset oscillators each being coupled with a second input of said mixer means;

selection means coupled with said first and second gated offset oscillator means for supplying an enabling gating signal to a selected one of said first and second gated offset oscillator means corresponding to the frequency band in which a desired selected transmitted signal appears;

programmable frequency divider means coupled with the output of said mixer means and coupled with and controlled by said selection means for dividing the frequency of the output signal of said mixer means by an amount having a predetermined relationship with said desired selected transmitted frequency;

reference oscillator means producing a reference signal on an output thereof;

phase comparator means having an output and first and second inputs coupled respectively to the output of said reference oscillator means and the output of said programmable frequency divider means, the output of said phase comparator means providing a control voltage for tuning the local oscillator means.

3,883,808

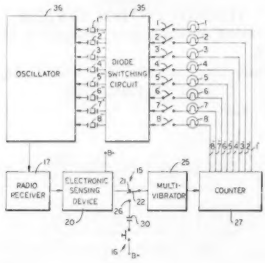
RADIO

Joseph E. Boone, 4808 Eastbourne Dr., Indianapolis, Ind. 46226, and Louis E. Schonegg, R.R. No. 3, Box 610 C, Brownsburg, Ind. 46112

Filed July 29, 1969, Ser. No. 845,683

Int. Cl. H04B *1/32*

U.S. Cl. 325—335 **18 Claims**



1. Radio apparatus comprising a radio receiver, said receiver being tunable to several different frequencies, means for stepping said receiver through said several frequencies in a regular order, means for locking said receiver on a given frequency as long as there is a signal received on that frequency, and for causing automatic resumption of said stepping after the signal ceases, means for causing said stepping to be automatic, means for visually indicating the frequency to which the receiver is tuned, squelch means for automatically muting the audio during said automatic stepping and switch means for manually precluding the operation of said locking means in response to signals on any selected single one of the frequencies while permitting operation of said locking means in response to signals on other frequencies of the several frequencies during said automatic stepping operation.

3,883,809

SUPERREGENERATIVE MIXERS AND AMPLIFIERS

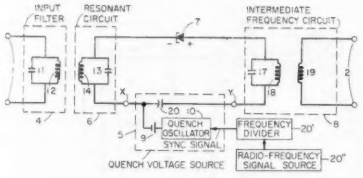
Peter Ver Planck, Arlington, and Godfrey T. Coate, Belmont, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 637,743, May 11, 1967, abandoned. This application Dec. 11, 1970, Ser. No. 97,332

Int. Cl. H03d *1/22*

U.S. Cl. 325—429 **17 Claims**

1. A superregenerative mixer comprising, in combination, a resonant circuit having an input to receive a radio-frequency signal and having its resonant frequency substantially at the center frequency of said radio-frequency signal, a tunnel diode electrically connected to the resonant circuit, bias means electrically connected in the mixer circuit for establishing an operating point on the tunnel diode current versus voltage characteristic, quench means electrically connected to said tunnel diode and operable to move the operating point of said tunnel diode between regions of negative and positive incremental conductance at a quench frequency much less than the frequency of said signal to cause oscillations in said resonant circuit periodically to grow and decay at the quench frequency, said radio-frequency signal and high-order harmonics of the quench frequency being amplified and mixed by the tunnel diode to produce a resultant intermediate-frequency signal, and intermediate-frequency circuit means electrically connected to said tunnel diode to separate the intermediate-frequency signal generated in said tunnel diode from other signals and couple the intermediate-frequency signal thereby derived to an output, said quench means being



operable to provide a quench frequency one of whose high-order harmonics differs from the radio-frequency signal by the frequency of the intermediate-frequency signal, thereby providing a plurality of quench-frequency high-order harmonics to beat with the plurality of frequency components of the amplified radio-frequency signal to produce said intermediate-frequency.

3,883,810

DEVICE FOR THE USE IN FREQUENCY OF A SHORT DURATION ELECTRICAL SIGNAL

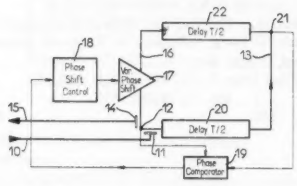
Maurice Tacussel, Boulogne-Billancourt, France, assignor to Electronique Marcel Dassault, Paris, France

Filed May 16, 1973, Ser. No. 360,849

Claims priority, application France, May 26, 1972, 72.18964

Int. Cl. H03b *3/08*

U.S. Cl. 328—155 **7 Claims**

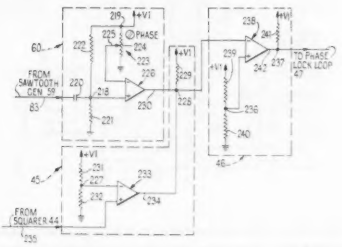


1. A device for storing a short duration signal comprising a read-in-station having an input means for receiving the signal, a read-out-station having an output means for transmitting the signal, a first signal delay means, a second signal delay means, said stations and said delay means being serially connected to form a closed signal-recirculation loop with said second signal delay means being located to receive the signals from said first signal delay means, phase comparator means connected to said read-in-station and to a point of said loop between said first and second delay means, means for adjustably phase shifting a signal circulating between said read-out-station and said second delay means, and phase shift control means coupling said phase comparator means and said means for adjustably phase shifting the circulating signal, whereby the transit time around the loop of the circulating signal is so controlled as to provide at the read-out-station a signal in phase with the signal introduced at the read-in-station.

3,883,811
DENSITOMETER

Gerald Lance Schlatter, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 423,409, Dec. 10, 1973. This application Aug. 12, 1974, Ser. No. 496,633
Int. Cl. H03k *5/153*
U.S. Cl. 328—155 **4 Claims**

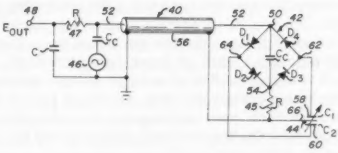


1. Apparatus for producing a sine wave signal manually adjustable in phase, said apparatus comprising: a phase adjustment circuit having input and output leads; first means having an output lead connected to said circuit input lead and actuable to produce a saw-tooth signal having ramps, said first means being actuable to impress said saw-tooth signal repeatedly at a predetermined fundamental frequency on said circuit input lead, the rate of change of the magnitude of said signal with respect to time being constant during actuating portions of said signal during which said ramps are generated, said circuit including adjustment means to cause a pulse to be impressed upon said circuit output lead each time the magnitude of said ramp becomes equal to a predetermined magnitude, said predetermined magnitude being adjustable with said adjustment means; a phase lock loop having input and output leads; and second means connecting said circuit output lead to said phase lock loop input lead, said phase lock loop producing a sine wave signal on said output lead thereof of said predetermined fundamental frequency and of a phase adjustable in accordance with the adjustment of said adjustment means.

3,883,812
DIODE-QUAD BRIDGE CIRCUIT MEANS

Dean R. Harrison, Sunnyvale, and John Dimeff, San Jose, both of Calif., assignors to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Continuation-in-part of Ser. No. 209,618, Dec. 20, 1971, abandoned. This application Jan. 16, 1974, Ser. No. 433,968
Int. Cl. H03d *1/10;* **H03k** *17/56*
U.S. Cl. 329—166 **10 Claims**

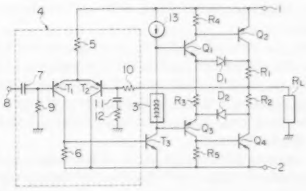


1. Diode-quad bridge circuit means comprising:
a diode bridge including first, second, third and fourth bridge terminals consecutively coupled together by four diodes polarized in circulating relationship;
a coaxial cable including an inner conductor and an outer conductor, one end of said inner conductor being coupled to said first bridge terminal, and one end of said outer conductor being coupled to said third bridge terminal;
a signal source for developing a signal of balanced alternating polarity, said signal source having a first source terminal coupled to the other end of said outer conductor, and a second source terminal;
a first coupling capacitor coupling said second source terminal to the other end of said inner conductor;
a second coupling capacitor coupling said first bridge terminal to said third bridge terminal;
a first impedance means connected between said second bridge terminal and said one end of said outer conductor;
a second impedance means connected between said fourth bridge terminal and said one end of said outer conductor; and
an output terminal coupled to said other end of said inner conductor whereby the voltage developed between said output terminal and said first source terminal is proportional to the difference of the impedances of said first impedance means and said second impedance means divided by the sum of the impedances of said first impedance means and said second impedance means.

3,883,813
LOW-FREQUENCY POWER AMPLIFIER

Mamoru Sekiya, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corporation, Nagoya-shi, Aichi-ken, Japan

Filed Feb. 11, 1974, Ser. No. 441,420
Claims priority, application Japan, July 19, 1973, 48-82268
Int. Cl. H03f *3/18*
U.S. Cl. 330—13 **1 Claim**

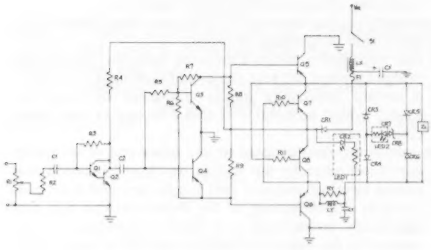


1. A low-frequency amplifier circuit arrangement designed for Class "B" or "AB" operation, comprising:
a first amplifier stage including a first transistor of a first conductivity-type and a second transistor of a second conductivity-type having the base thereof connected with the collector of said first transistor; a second amplifier stage including a third transistor of said second conductivity-type and a fourth transistor of said first conductivity-type having the base thereof connected with the collector of said third transistor; said second and fourth transistors having the collectors thereof connected to a load to alternately drive said load; and means for preventing said first and third transistors from being brought into cut-off condition, regardless of whether one of said second and fourth transistors are driving said load; said means comprising bias circuit means connected between the bases of said first and third transistors, a non-grounded resistor through which the emitters of said first and third transistors are connected to each other, a first diode having the anode and cathode thereof connected to the emitter of said first transistor and the collector of said second transistor respectively, and a second diode having the anode and cathode thereof connected to the collector of said fourth transistor and the emitter of said third transistor respectively.

3,883,814
HIGH FIDELITY SOLID STATE MOBILE AMPLIFIER

Richard J. Weisenberger, 8 Kentaboo Dr., Erlanger, Ky. 41018

Filed May 1, 1974, Ser. No. 466,021
Int. Cl. H03f 3/04
U.S. Cl. 330—14 18 Claims



10. A direct coupled transformerless power amplifier operating from a single-ended power source and adapted to amplify a grounded input audio signal, said amplifier comprising:

a. a full wave transistor bridge circuit including four transistors of like conductivity;

b. a first pair of said four transistors having their emitters connected together at a first node, said first node being in electrical communication with said single-ended power source;

c. a second pair of said four transistors each having its collector connected to a reference potential wherein the collectors of said first pair of said four transistors are connected respectively to the emitters of said second pair of said four transistors, said connections defining second and third nodes;

d. said second node being in electrical communication via first resistive means with the base of the transistor of said first pair of said four transistors whose collector terminates in said third node, said third node being in electrical communication via second resistive means with the base of the transistor of said first pair of said four transistors whose collector terminates in said second node;

e. a load connected across said second and third nodes to receive the output of said transistor bridge circuit;

f. an input driver stage including first and second input transistors of opposite conductivity the emitter of said first input transistor and the collector of said second input transistor being connected together at said reference potential;

g. the collector of said first input transistor being connected to the base of the transistor of said second pair of said four transistors whose emitter terminates in said second node, via third resistive means to said first node and via fourth resistive means to its base, and

the emitter of said second input transistor being connected to the base of the transistor of said second pair of said four transistors whose emitter terminates in said third node and via fifth resistive means to said first node; and

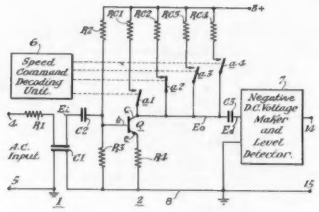
h. the base of said first input transistor being connected via resistive means to the base of said second input transistor and

the bases of said first and second input transistors in electrical communication with said ungrounded audio input signal.

3,883,815
FAIL-SAFE SELECTABLE LOW-PASS FILTERING

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Aug. 15, 1973, Ser. No. 388,370
Int. Cl. H03f 3/04
U.S. Cl. 330—21 8 Claims

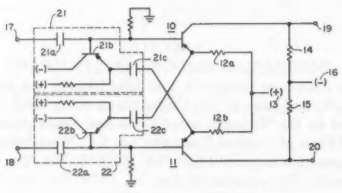


1. A vital type of a selectable low-pass filtering circuit comprising, a half section filter network including a resistive element and a four-terminal capacitive element, said four-terminal capacitive element having a first and a second pair of terminals, said first pair of terminals coupled to a source of a.c. input signals, and a variable gain amplifier having its input connected to said second pair of terminals and having its output coupled to at least a select one of a plurality of load resistors so that the gain of the amplifier is varied in accordance with the value of the selected load resistor.

3,883,816
DIFFERENTIAL AMPLIFIER

Donald T. Best, Lafayette Hill, and John B. Schwarz, Abington, both of Pa., assignors to Sperry Rand Corporation, Blue Bell, Pa.

Filed Mar. 11, 1974, Ser. No. 450,122
Int. Cl. H03f 3/68
U.S. Cl. 330—30 R 1 Claim

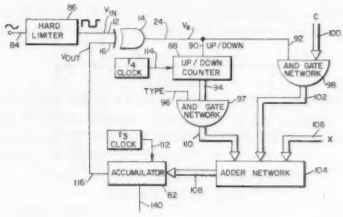


1. A differential amplifier comprising: a pair of transistor elements each having base, emitter, and collector electrodes, separate impedance means connecting the respective emitter electrodes to a source of operating potential, output signal means connecting the collector electrodes to a source of operating potential, a pair of input signal terminals, a first signal path coupling the first of said pair of input signal terminals to the base electrode of a first one of said pair of transistors, a second signal path coupling the second of said input signal terminals to the base electrode of the second of said pair of transistors, a first emitter follower transistor cross coupling the said first input signal terminal to the emitter of said second transistor of said pair of transistors, and a second emitter follower transistor cross coupling the second of said pair of input terminals to the emitter electrode of the first of said pair of transistors.

3,883,817
DIGITAL PHASE-LOCKED LOOP

Rodger A. Cliff, Upper Marlboro, Md., assignor to United States Government National Aeronautics and Space Adm., Office of General Counsel-Code GP, Washington, D.C.

Filed Aug. 20, 1973, Ser. No. 389,929
Int. Cl. H03b *3/04*
U.S. Cl. 331—1 A **3 Claims**



1. A phase-locking apparatus for producing a system output signal having a phase which is responsive to the phase of an input signal comprising:

phase detector means responsive to the input and system output signals for deriving a two state output signal from the phase detector means having a variable duty cycle indicative of the relative phase of the input and system output signals;

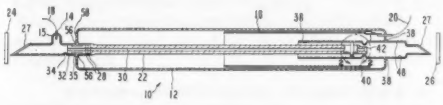
an accumulator having an output terminal on which is derived said system output signal; and

incrementing means including means for adding a signal representing a first constant to the accumulator at a fixed rate in response to the first output state of the phase detector and means for adding to the accumulator a signal representing a second constant at the fixed rate in response to the second output state of the phase detector.

3,883,818
METAL-VAPOR LASER WITH IMPROVED VAPOR CONDENSING MEANS

Steven James Heising, San Jose; Mark W. Dowley, Palo Alto, and William A. Shull, Portola Valley, all of Calif., assignors to Coherent Radiation, Palo Alto, Calif.

Filed Apr. 27, 1973, Ser. No. 354,988
Int. Cl. H01s *3/22, 3/05*
U.S. Cl. 331—94.5 G **13 Claims**



1. A gas laser comprising:

a. means for enclosing a lasing medium comprising at least one normally non-gaseous constituent which is in the vapor state during the operation of the laser;

b. an anode and a cathode and a direct current electrical discharge therebetween through said lasing medium;

c. a bore tube for confining said discharge and having an open end at the cathode end of the laser;

d. an optical resonator axially aligned with at least a part of said electrical discharge path;

e. means for transporting said vaporized constituent along said bore tube in the direction of said open end of said bore tube;

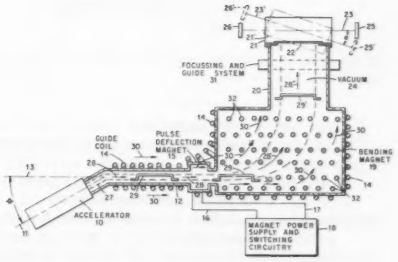
f. means for causing condensation of said vaporized constituent outside the region of said electrical discharge comprising physical barrier means for reversing the path of said direct current electrical discharge as the electrical discharge exits from said open end of said bore tube to separate said electrical discharge from said transported vaporized constituent; and

g. means for accepting the condensation of the spent vaporized constituent outside of the region of the discharge after said transported vaporized constituent exits from said open end of said bore tube and is separated from said electrical discharge.

3,883,819
APPARATUS FOR UNIFORM PUMPING OF LASING MEDIA

William C. Condit, and Samuel F. Eccles, both of Livermore, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation-in-part of Ser. No. 315,261, Dec. 14, 1972, abandoned. This application May 23, 1974, Ser. No. 472,928
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 PE **10 Claims**



1. An apparatus for uniform pumping of a contained lasing media with short and intense electron pulses, comprising a linear electron accelerator for producing electron pulses, beam pipe means operatively connected to receive electron pulses from said linear electron accelerator, magnetic means operatively connected to said beam pipe means and to a vessel containing said lasing media for turning the electron pulse around a point where it moves laterally with respect to rather than axially parallel to said vessel containing said lasing media, guide coil means for wrapping electron trajectory of the thus produced pulses into tight spirals thereby slowing the forward velocity of the electrons traveling toward said lasing media, said guide coil means being positioned around said beam pipe means and said magnetic means, and window means positioned between said magnetic means and said vessel for admitting the electron pulses into said vessel which pump said lasing media contained in said vessel to an excited state creating a population inversion in said lasing media.

3,883,820
GAS LASER HAVING IMPROVED MULTIPLE-PART RESONATOR ADJUSTMENT

Edward Samuel Burns, Woodside, and Steven James Heising, San Jose, both of Calif., assignors to Coherent Radiation, Palo Alto, Calif.

Filed Apr. 27, 1973, Ser. No. 355,154
Int. Cl. H01s *3/22, 3/05*
U.S. Cl. 331—94.5 C **5 Claims**

1. A gas laser comprising:

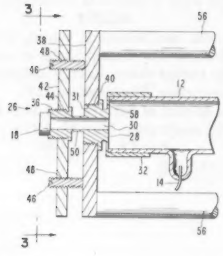
a. envelope means for enclosing the gaseous medium;

b. means for exciting said gaseous laser medium to provide energy levels therein required for laser action;

c. a pair of optical resonator mirrors; and

d. a mirror support and alignment assembly for at least one of said resonator mirrors comprising:

i. a flexible hub member having a central aperture therethrough axially aligned with the gaseous medium, said hub member having a threaded outside surface;
ii. means for mounting a resonator mirror to sealingly cover the central aperture of said hub member;
iii. mirror adjustment and baseplates each having a threaded central aperture for screwed-on engagement with said threaded surface of said hub member so that



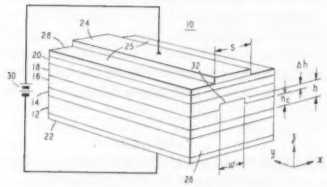
said plates are parallel and spaced apart from each other, said mirror adjustment plate being situated nearest to said mirror;
iv. said mirror adjustment plate having a plurality of bores located through the periphery thereof; and
v. adjusting members extending through each of said peripherally-located bores to buttingly engage said baseplate for flexing said hub member to optically align and adjust said optical resonator mirrors.

3,883,821

SINGLE TRANSVERSE MODE OPERATION IN DOUBLE HETEROSTRUCTURE JUNCTION LASERS HAVING AN ACTIVE LAYER OF NONUNIFORM THICKNESS

Stewart Edward Miller, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 17, 1974, Ser. No. 434,181
Int. Cl. G02f *3/00*
U.S. Cl. 331—94.5 H **7 Claims**



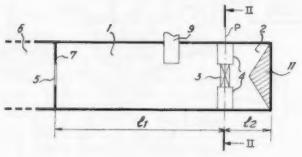
1. In a double heterostructure junction laser, a semiconductor body comprising first and second wide bandgap layers, a relatively narrower bandgap third region disposed intermediate to and contiguous with said first and second layers, and a p-n junction located in said third region; characterized in that said third region includes an active region of greater thickness than the remainder of said third region, the dimensions of said active region being effective to confine radiation to substantially a single transverse mode when said p-n junction is forward biased.

3,883,822

NEGATIVE RESISTANCE DIODE OSCILLATOR

Jean-Raymond Basset, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 10, 1973, Ser. No. 423,488
Claims priority, application France, Dec. 12, 1972, 72.44177
Int. Cl. H03b *7/06*
U.S. Cl. 331—107 R **3 Claims**



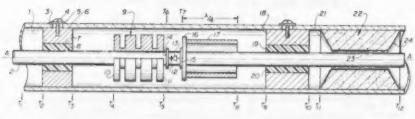
1. An oscillator comprising:
a metallic body formed with a prismatic main cavity, resonant at a predetermined operating frequency, and an adjoining low-Q auxiliary cavity constituting an extension of said main cavity, said cavities meeting at a common transverse plane;
a negative-resistance diode with an axis in said plane connected across said cavities, said main cavity having an output end coupled to an external load and spaced from said plane by substantially half a wavelength at said operating frequency; and
a dissipative load in said auxiliary cavity separated from said plane by a distance substantially less than the spacing of said plane from said output end.

3,883,823

BROAD BAND HIGH FREQUENCY CONVERTER WITH INDEPENDENT CONTROL OF HARMONIC FIELDS

Martin I. Grace, Framingham, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 8, 1974, Ser. No. 486,546
Int. Cl. H03b *5/12*
U.S. Cl. 331—107 R **8 Claims**



1. A high frequency energy converter comprising:
first and second conductor means spaced apart in longitudinally aligned relation,
third conductor means coextensive with said first and second conductor means,
semiconductor means forming first and second conductive junction means at said first and second conductor means,
distributed filter means conductively disposed on one of said first or third conductor means adapted to pass high frequency fundamental energy,
first impedance matching means spaced with respect to said distributed filter means opposite said semiconductor means and conductively disposed on one of said first or third conductor means,
capacitive means coupled to said second conductor at said second junction for forming a substantial short circuit between said second and third conductor means with respect to harmonics of said high frequency fundamental energy greater than the fourth harmonic thereof,

folded choke means conductively disposed on said capacitive means for forming a substantial short circuit at said second junction means between said second and third conductor means with respect to said high frequency fundamental energy and odd harmonics thereof, and

second impedance matching means spaced with respect to said folded choke means opposite said semiconductor means and conductively disposed on one of said second or third conductive means for independently controlling the impedance between said second and third conductor means at said second junction means with respect to even harmonics of said fundamental frequency energy.

3,883,824

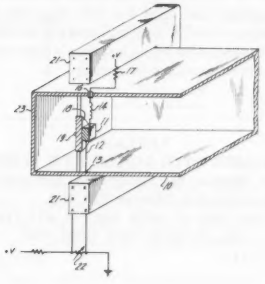
DIELECTRIC-YIG TUNER FOR BULK OSCILLATORS

Maurice Weiner, Ocean Township, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 30, 1974, Ser. No. 493,000

Int. Cl. H03b *7/14*

U.S. Cl. 331—107 G **10 Claims**



1. In combination:

means for defining an electromagnetic field bounding region:

a device mounted in said electromagnetic field bounding region; said device having a negative resistance portion on its characteristic;

means for biasing said device into said negative resistive portion of its characteristic;

a dielectric resonator mounted in said electromagnetic field bounding region adjacent to said device;

a YIG sample mounted in said electromagnetic field bounding region adjacent to said dielectric resonator; and

means for providing an adjustable magnetic field to said YIG sample.

3,883,825

INTEGRATED CIRCUIT RELAXATION OSCILLATOR HAVING MINIMAL EXTERNAL PADS

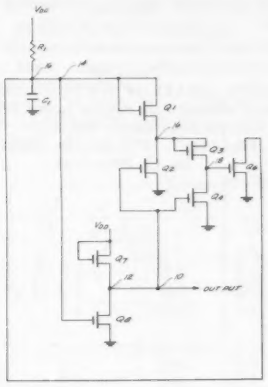
Burton E. Cohen, Huntington Station, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Filed Feb. 19, 1974, Ser. No. 443,235

Int. Cl. H03b *5/24*

U.S. Cl. 331—111 **24 Claims**

1. An oscillator circuit comprising an output node, a control node, first means operatively connected to said output node and said control node and responsive to the voltage at said control node such that when the voltage at said control node is at a first value to charge said output node to a given voltage and when the voltage at said control node is at a second value to charge said output node to a different voltage, charging means operatively connected to said control node and effective to charge said control node from said first value through said second value to a third value over a period of time, and second means operatively connected to said control node and effective to return said control node to said first value when



it reaches said third value and then permit it to recharge to said third value.

3,883,826

ADJUSTABLE FREQUENCY OSCILLATOR WITH REGENERATIVE FEEDBACK AND A COUPLING UNIT INCLUDING A DIFFERENTIAL AMPLIFIER FOR ADJUSTING THE FEEDBACK

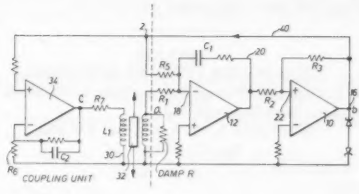
Ian John Kirby, Reading, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 269,023, July 5, 1972, abandoned. This application Nov. 13, 1973, Ser. No. 415,320

Claims priority, application United Kingdom, July 15, 1971, 33236/71

Int. Cl. H03k *3/295*

U.S. Cl. 331—143 **7 Claims**



1. An adjustable frequency oscillator comprising

a negative feedback, operational amplifier functioning as an integrator whose output is connected to a bistable-bipolar threshold device, said threshold device comprising an operational amplifier connected as a Schmitt trigger and having a resistive negative feedback loop for providing a bistable-bipolar output and switching the bipolar output from one stable state to the other stable state each time the input voltage applied thereto exceeds a predetermined fraction of the bipolar output and has a polarity opposite to the bipolar output,

a regenerative feedback connection between the output of the threshold device and an input of the integrator and

an adjustable coupling unit for adjusting the amount of regenerative feedback including a differential transformer having a primary winding feed from the output of said thershold device and a secondary winding connected to the input to said integrator, and a further operational amplifier connected to the output of said device having a

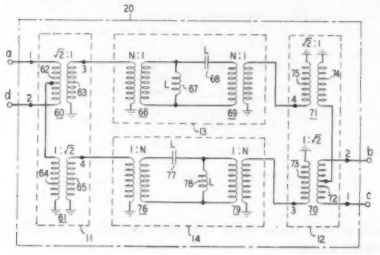
negative feedback loop including a resistance and a capacitance connected in parallel, said further operational amplifier connecting said primary winding, to the output of said operational amplifier functioning as a Schmitt trigger.

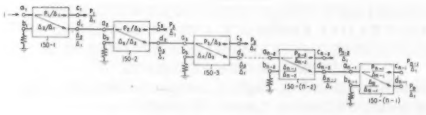
3,883,827

TANDEM ARRAYS OF IN-PHASE COUPLERS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 2, 1974, Ser. No. 466,213
Int. Cl. H01p *5/04*
U.S. Cl. 333—10 **15 Claims**





1. An in-phase hybrid coupler circuit having a prescribed overall signal division ratio which varies as a function of frequency over a given frequency band of interest comprising:

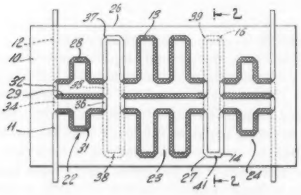
a tandem array of in-phase hybrid couplers at least one of which has a signal division ratio that varies as a function of frequency over said band of interest and is different from said prescribed signal division ratio.

3,883,828

HIGH-POWER COUPLER SYNTHESIS

Joseph D. Cappucci, Wayne, N.J., assignor to Merrimac Industries, Inc., West Caldwell, N.J.

Filed June 3, 1974, Ser. No. 475,603
Int. Cl. H01p *5/14*
U.S. Cl. 333—10 **9 Claims**



7. A distributed parameter device having a center operating frequency including:

first and second lines electromagnetically coupled to each other; said first line providing first and second terminals at opposite ends thereof; said second line providing third and fourth terminals at opposite ends thereof; said electrical length of said first and second lines being equal; said first and second line exhibiting an even mode impedance of Z_e when said first, second, third and fourth terminals are terminated in an impedance of Z_t; said first and second lines exhibiting an odd mode impedance of Z_o when said first, second, third and fourth terminals are terminated in said impedance of Z_t, where:

$Z_t = \sqrt{Z_e Z_o}$;

said first and second coupled lines exhibiting equal phase velocity in said even and odd modes of excitation;

third and fourth lines electromagnetically coupled to each other; said third line providing fifth and sixth terminals at opposite ends thereof; said fourth line providing seventh and eighth terminals at opposite ends thereof; said electrical length of said third and fourth lines being equal; said third and fourth lines exhibiting said even mode impedance of Z_e when said fifth, sixth, seventh and eighth terminals are terminated in said impedance of Z_t; said third and fourth lines exhibiting said odd mode impedance of Z_o when said fifth, sixth, seventh and eighth terminals are terminated in said impedance of Z_t; said third and fourth coupled lines exhibiting equal phase velocity in said even and odd modes of excitation;

a fifth line for connecting said second terminal to said fifth terminal; said fifth line covering the shortest distance between said second and fifth terminals;

a sixth line for connecting said fourth terminal to said seventh terminal; said sixth line covering the shortest distance between said fourth and seventh terminals;

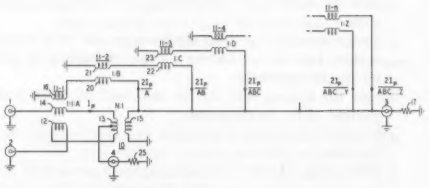
said first and third lines being less than a quarter wavelength at said center operating frequency.

3,883,829

TRANSFORMER WITH ADJUSTABLE TURNS RATIO

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 22, 1974, Ser. No. 472,116
Int. Cl. H03h *7/00;* **G05f** *3/04*
U.S. Cl. 333—11 **4 Claims**



1. A transformer circuit comprising:

a two-winding principle transformer having an actual primary winding-to-secondary winding turns ratio of N:1;

and at least one three-winding vernier transformer whose first, second, and third windings are in the ratio of 1:1:A; one end of said first winding being connected to one end of the primary winding of said principle transformer;

one end of said second winding being connected to the other end of said primary winding;

said first and second windings being further arranged so that the magnetic fields produced thereby by a common current flowing through said first, second and primary windings add constructively;

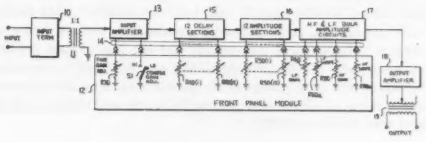
and means for connecting the third winding of said vernier transformer across the secondary winding of said principle transformer;

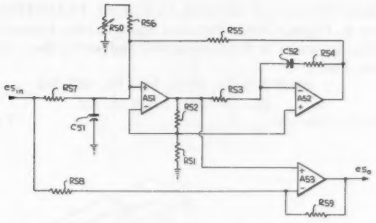
said transformer circuit having an effective turns ratio N_{eff}:1 between the other ends of said first and second windings and said secondary winding of $(N \pm 2/A)$:1.

3,883,830
LINE CONDITIONER WITH INDEPENDENT GAIN AND DELAY CONTROL

Norris C. Hekimian, Rockville, Md., assignor to Hekimian Laboratories, Inc., Rockville, Md.

Filed May 13, 1974, Ser. No. 469,707
Int. Cl.² H03H 7/14
U.S. Cl. 333—28 R **35 Claims**





1. A line conditioner system providing adjustable compensation for frequency-dependent distortion introduced by a transmission line onto signals within a prescribed frequency range which are transmitted along the transmission line, said system comprising:

broadband input amplifier means arranged to receive signals from said transmission line, said broadband amplifier having an adjustable gain for all signal frequencies in said prescribed frequency range;

a plurality of cascaded delay circuits connected in cascade with said broadband amplifier means, each delay circuit being tuned to a different frequency within said prescribed frequency range and including delay adjustment means for adjusting signal delay therethrough in a relatively small range of frequencies centered at said tuned frequency, each delay circuit having a constant gain versus frequency characteristic;

a plurality of cascaded amplitude circuits connected in cascade with said delay circuits, each amplitude circuit being tuned to a different mid-band frequency within said prescribed frequency range and including amplitude adjustment means for adjusting circuit gain in a relatively small range of frequencies centered at said tuned frequency, said amplitude adjustment means being connected to vary the bandwidth and mid-band frequency gain of said circuit such that the product of said bandwidth and mid-band frequency gain is independent of adjustments of said amplitude adjustment means; and

output amplifier means connected in cascade with said delay and amplitude circuits for providing an output signal from said system and providing a system output impedance which is matched to a predetermined impedance;

wherein each of said delay circuits includes:

a delay circuit input terminal;

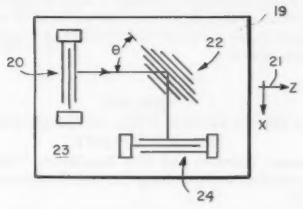
a first active gyrator simulating an inductive impedance and connected in series with said delay circuit input terminal;

a capacitor connected in parallel across said gyrator; and said delay adjustment means in the form of an adjustable resistance connected between ground and the end of said capacitor remote from said delay circuit input terminal.

3,883,831
SURFACE WAVE DEVICES

Richard C. Williamson, Framingham, and Ernest Stern, Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sept. 27, 1973, Ser. No. 401,461
Int. Cl. H03h 9/26, 9/30; H01v 7/00
U.S. Cl. 333—30 R **43 Claims**



1. A device for handling surface elastic waves comprising

a substrate capable of propagating surface elastic waves having a selected direction of propagation on a selected surface thereof;

first transducer means formed on said surface for generating surface elastic waves on said surface in said direction;

at least one set of parallel reflective elements having preselected dimensions being formed at said surface and arranged at a preselected angle of incidence to the direction of propagation of said surface elastic waves to provide a reflection of said surface elastic waves at a preselected angle of reflection;

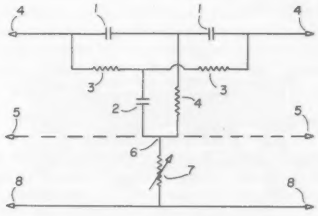
at least one of the dimensions of said reflective elements arranged to vary in a predetermined manner from element to element for achieving a non-linear relationship between the path length of said surface elastic wave and the frequency of said wave to provide a filtering action for said reflected surface elastic wave; and

second transducer means formed on said surface for receiving said reflected and filtered surface elastic waves.

3,883,832
SINGLE ELEMENT CONTROLLED PARALLEL-T AUDIO NETWORK

James Wayne Fosgate, 3023 E. Charles Oak Rd., Phoenix, Ariz. 85032

Filed Nov. 6, 1972, Ser. No. 304,204
Int. Cl. H03h 7/10, 7/16
U.S. Cl. 333—70 CR **1 Claim**



1. A single element controlled parallel-T network comprising: a pair of capacitors coupled together in series; a first conductor coupling said capacitors; a pair of fixed resistors coupled together in series; a second conductor coupling said resistors; a third resistor having one end thereof coupled to

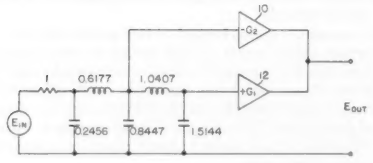
said first conductor between said capacitors; said third resistor having an opposite end; and a third capacitor having one side coupled to and between said pair of fixed resistors; said third capacitor having an opposite side; a third conductor coupling said opposite side of said third capacitor to said opposite end of said third resistor; and a variable resistor having one end coupled to said third conductor; said variable resistor having a second end; a first terminal coupling at said second end of said variable resistor; second and third terminal couplings at opposite sides of said first pair of capacitors from said first conductor; said fixed resistors having opposite ends from those connected to said second conductor; said last mentioned opposite ends coupled to respective ones of said second and third terminal couplings, whereby adjustment of said variable resistor may cause a change in frequency at which maximum attenuation occurs.

3,883,833

LINEAR PHASE FILTER WITH DETERMINABLE GAIN CHARACTERISTIC

Koho Ozone, Webster, and Uno Randmere, Victor, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,052
Int. Cl. H03h *7/10, 7/32*
U.S. Cl. 333—70 R **1 Claim**



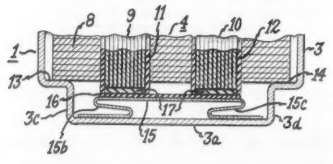
1. A "phase less" corrected linear phase filter comprising a linear phase filter of the LC type having an open circuit termination, amplifiers having high input impedances, the inputs of said amplifiers being connected to selected junctions between the reactive components of the filter, and means connecting the outputs of said amplifiers to a common output terminal so that the signal at the common output terminal represents the sum of the output signals of the amplifiers.

3,883,834

BALLAST TRANSFORMER WITH HEAT DISSIPATING DEVICE

Carl M. Osteen, Zirconia, N.C., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 13, 1973, Ser. No. 424,559
Int. Cl. H01f *27/08*
U.S. Cl. 336—61 **6 Claims**



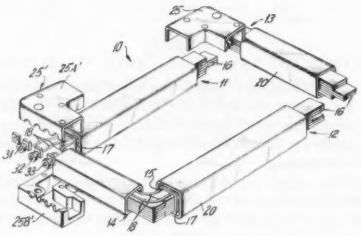
1. An electrical ballast device comprising, in combination, a housing of heat conductive material having a wall, an inductive ballast device mounted in said housing comprising a core and coil assembly, a heat conductive resilient member arranged between said core and coil assembly and said housing wall and resiliently urged in thermal contact therewith for transmitting heat from said assembly to said housing for dissipation thereby, and electrically insulating and thermally conducting means interposed between said resilient member and said core and coil assembly, said resilient member being formed of a top and compressible spring leg means, said inductive ballast device resting on said top and holding said spring leg means compressed in contact with said housing wall, said core and coil assembly comprising an elongated core member and coil means surrounding said core member, said coil means resting against said resilient member, said electrically insulating and thermally conducting means being arranged between said coil means and the top of said resilient member, said electrically insulating and thermally conducting means comprising a layer of elastic material on said coil means and a sheet of dielectric material between said elastic material and said resilient member.

3,883,835

GROUND FAULT SENSOR CURRENT TRANSFORMER

John A. Pagon, Clearwater, and Spotz Erwin, Largo, both of Fla., assignors to Electromagnetic Industries, Inc., Clearwater, Fla.

Filed July 10, 1974, Ser. No. 487,362
Int. Cl. H01f *17/06, 27/02*
U.S. Cl. 336—90 **7 Claims**



1. A current transformer, particularly for use with a ground fault current sensor, comprising, in combination, a rectangular core of ferromagnetic metal, said core having four legs disengageably interengaged, at the corners of the core, at right angles to each other; respective secondary winding sections wound on at least two of said legs and connected to each other and to output terminals; respective tubes of dielectric material telescoped over each leg, said tubes enclosing said winding sections; and four corner brackets of dielectric material each receiving and clamping the ends of two tubes and the core at a respective corner of said core; two of said brackets being readily removable, together with the tube and core leg extending therebetween, to provide for installation of said transformer over existing ductwork and bus-bars.

3,883,836

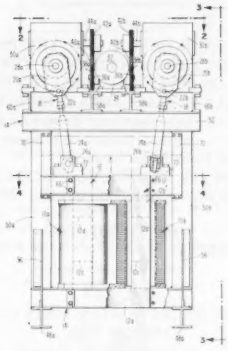
VARIABLE INDUCTIVE REACTOR

Charles F. Ward, Jr., Malvern, Pa., and Norman L. Smith, Haddonfield, N.J., assignors to James G. Biddle Company, Plymouth Meeting, Pa.

Filed Apr. 22, 1974, Ser. No. 462,634
Int. Cl. H01f *21/06*
U.S. Cl. 336—134 **9 Claims**

1. A variable inductive reactor comprising,
a pair of laminated iron core members, each having at least a portion of generally U-shape, the legs of which are opposed and together define a magnetic circuit, said core members being separable to provide air gaps in the magnetic circuit between the opposed legs,

a frame supporting one of said core members,
coil means supported on said frame and positioned to surround at least one of said opposed legs at the air gap, thereby to provide a variable inductive reactor,
movable support means for supporting the other of said core members having a slidable cooperative relationship with said frame whereby movement is restricted to a predetermined fixed and repetitive path producing an



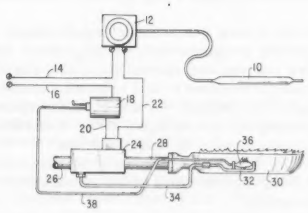
opening of the air gap in one direction and a closing of the air gap in the other direction of movement,
actuator means acting between the frame and the support means to produce such movement and including a pair of symmetrically arranged crank elements connected to articulated linkages, and
drive means to move the cranks in synchronism between predetermined positions providing preselected alternative core positions.

3,883,837

THERMAL RESPONSIVE SWITCH

Denis G. Wolfe, Santa Ana, and Joseph S. Danon, El Toro, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 5, 1973, Ser. No. 412,844
Int. Cl. H01h *37/40*
U.S. Cl. 337—326 **11 Claims**



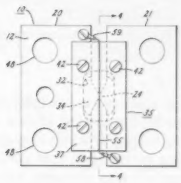
1. A thermal responsive switch comprising
a pair of contacts,
means forming a chamber,
a charge of gas in the chamber,
a carbonaceous adsorbent material in the chamber capable of adsorbing a quantity of the gas, and
a member movable in response to a change in gas pressure in the chamber for moving one of the pair of contacts relative to the other contact,
said carbonaceous adsorbent material being formed from a synthetic polymer selected from the group consisting of polyvinylidene chloride and polyvinylidene fluoride by removing the non-carbon components to produce cavities of sufficient size to adsorb the gas.

3,883,838

HIGH-CURRENT CURRENT-LIMITING FUSE

Ernest H. Bogert, Media, and Peter Kotos, Havertown, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Apr. 1, 1974, Ser. No. 456,701
Int. Cl. H01h *85/04*
U.S. Cl. 337—295 **10 Claims**



1. A current-limiting fuse comprising:
a. a plate of high-conductivity metal having a central longitudinal axis and two spaced-apart notches extending transversely of said axis from opposite lateral edges of said plate to points near said axis, thereby dividing said plate into: (a_1) two tang portions spaced apart along said longitudinal axis at opposite sides of said notches and (a_2) a neck portion interconnecting said tang portions and located between the inner ends of said notches,
b. said tang portions constituting fuse terminals and said neck portion constituting fusible conducting means for carrying current between said tang portions and for melting in response to overcurrents,
c. said neck portion being integral with said tang portions, the junctions between said neck portion and said tang portions being free of solder, and the neck portion, the tang portions, and said junctions all being of the same material and formed from the same part,
d. each of said tang portions having a relatively large cross-section in any plane therethrough normal to said longitudinal axis compared to the cross-section of said neck portion in any plane therethrough normal to said longitudinal axis,
e. a housing of insulating material surrounding said neck portion and comprising: plates of insulating material at opposite faces of said conductive plate and portions of insulating material extending into said notches,
f. and means for securing said insulating plates to said tang portions and to each other, thereby effectively preventing motion of said tang portions relative to each other,
g. said tang portions having end regions located outside said housing adapted to be secured to external circuitry.

3,883,839

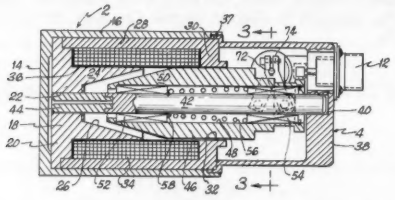
POSITIONING DEVICE

William J. Barrett, and Hal G. Meyer, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Oct. 29, 1973, Ser. No. 410,784
Int. Cl. H01l *13/00;* **H02k** *41/02*
U.S. Cl. 338—116 **10 Claims**

1. A positioning device comprising a base formed of magnetizable material having an end portion provided with an opening in the center thereof and a central cup portion extending from said end portion having an interior surface tapering from its free end toward said end portion, a coil housing of magnetizable material extending from said end portion and having a

central opening at its end remote from said end portion, an annular actuating coil supported between said end portion and said end of said coil housing remote from said end portion, an actuator shaft mounted in said opening in said end with its longitudinal center line passing through the center line of said central cup interior and said central opening in said coil housing, a hollow actuator of magnetizable material encompassing said actuator shaft and tapered at one end whereby its outer



surface at said one end conforms to the interior surface of said central cup, a first bushing mounted in said actuator at said tapered end and having rolling bearings engaging said actuator shaft, a second bushing mounted in said actuator at its other end and having rolling bearings engaging said actuator shaft, a spring exerting a force on said actuator to urge said actuator away from said end portion of said base whereby the actuator is variably positioned along the actuator shaft as a function of the energization state of said coil.

3,883,840

ADJUSTABLE SPINDLE-TYPE RESISTOR ELEMENT

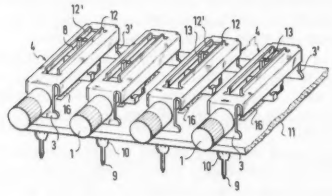
Peter Dornen, Riemerling; Martin Hindermayr, Aying, and Ferdinand Wagner, Munich, all of Germany, assignors to Firma Wilhelm Ruf OHG, Hohenkirchen, Germany

Filed Oct. 17, 1973, Ser. No. 407,145

Claims priority, application Germany, Oct. 18, 1972, 723818

Int. Cl. H01c 9/02

U.S. Cl. 338—128 **8 Claims**



1. An adjustable resistor element adapted to be mounted as a single element, or as one of a bank of similar elements, on a printed circuit board or the like in such a way that it cooperates with an elongated horizontal resistor slide track in the form of a resistive layer on the circuit board, or an equivalent variable resistance line, by contacting the slide track at a given, movable point along its length, the circuit board being assumed horizontal for purposes of definition used hereinbelow, the resistor element comprising in combination:

a horizontally extending housing of malleable, electrically conductive sheet metal having an elongated center panel and integral vertical end panels at the front and rear ends thereof;

a threaded horizontal spindle journalled in horizontally aligned bores in the vertical end panels of the housing, the spindle including an adjusting knob at its front end outside the forward vertical end panel;

a sliding block threaded for cooperation with the spindle so as to move therealong under spindle rotation, the sliding block carrying a flexible sliding finger having a contact point with the aforementioned slide track, or equivalent, of a printed circuit board;

means for axially retaining the spindle;

means for electrically connecting the sliding finger of the sliding block to the housing;

means defined by the housing for longitudinally guiding the sliding block against rotation; and

mounting means for connecting the end panels of the resistor element to the printed circuit board.

3,883,841

METHOD AND DEVICE FOR THE PRECISE LOCALIZED DETERMINATION OF THE ACOUSTIC IMPEDANCE OF MATERIAL SITUATED IN PROXIMITY TO THE WALL OF A BOREHOLE

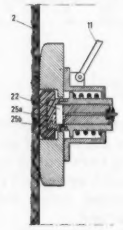
Guy Norel, Ru eil-Malmaison, and Robert Desbrandes, Clichy, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Filed Feb. 22, 1973, Ser. No. 334,710

Claims priority, application France, Feb. 22, 1972, 72.06010

Int. Cl. G01v 1/40

U.S. Cl. 340—15.5 A **24 Claims**



1. A method for the precise localized determination of the acoustic impedance of materials situated in proximity to the wall of a drilled well, into which there is introduced a measuring sonde connected by means of electrical conductors to a surface apparatus for processing the data supplied by said sonde, comprising the successive steps of:

a. emitting an acoustic impulse in a direction substantially perpendicular to the wall of the well traversing the mterials the acoustic impedance of which is to be determined, and through at least two intermediate elements having accurately known acoustic characteristics, a first of said intermediate elements being in contact with said materials;

b. receiving at least one acoustic impulse being reflected substantially perpendicularly to the contact surface of said first intermediate element and said materials;

c. generating in response to said reflected impulse, an electric signal representative of said acoustic impulse;

d. transmitting said electric signal to said means for processing the data supplied by said sonde; and

e. generating, in response to said electric signal, a resultant signal being representative of the acoustic impedance of said materials.

3,883,842

TRAFFIC STAGING CONTROL SYSTEM

Anthony B. Marmo, 7916 Coral Blvd., Miramar, Fla. 33023

Filed May 29, 1973, Ser. No. 364,436

Int. Cl. G08g 1/085

U.S. Cl. 340—41 R **4 Claims**

1. A uni-directional traffic control system for limiting the flow of traffic on a uni-directional highway to a desired maximum rate of flow comprising a staging area consisting of a

plurality of successive contiguous staging zones of predetermined average vehicle capacity, a plurality of spaced unidirectional stop and go traffic signals on said staging area, the size of each staging zone being determined by the spacing of the traffic signals, one signal being at the entrance to said staging area and one signal being at the exit end of each staging zone, said traffic signals being coordinated to provide a stop indication at only one signal at a time while simultaneously providing a go indication at each other signal, the stop indication progressing successively from the foremost signal at prescribed intervals to the next rearward signal, and then, at a prescribed time interval, the cycle is repeated indefinitely.

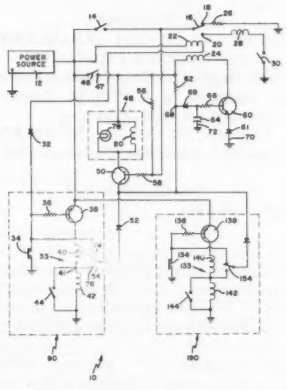
SEQUENCE TABLE

EVENT NUMBER	TIME INTERVAL (seconds)	START TIME	SIGNAL CONDITION D	C	B	A	RESULTS	NUMBER OF CARS RELEASED
1	45	0	G	G	G	R	Cars collect in staging zone AB	0
2	20	45	G	G	R	G	Cars leave zone AB, collect in zone BC	15
3	25	65	G	R	G	G	Cars leave zone BC, collect in zone CD	15
4	30	90	R	G	G	G	Cars leave zone CD, collect behind D	15
5	45	120	G	G	G	R	Same as event 1	0
6	20	165	G	G	R	G	Same as event 2	15
and so on ----------								

3,883,843
SEAT BELT SYSTEM WITH STARTER ENGINE LOCK AND ALARM

Juhan Telmet, Warren, and Richard C. Stouffer, Auburn Heights, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,580
Int. Cl. B60r *21/10*
U.S. Cl. 340—52 E **9 Claims**



1. A safety system adapted to be disposed in a vehicle having a starter motor and including a belt having a protracted and a retracted position comprising:

a. a power source for supplying electrical power;

b. a seat switch connected to said power source and associated with the driver's seat of the vehicle;

c. said seat switch having an open position when said seat is unoccupied and a closed position when said seat is occupied;

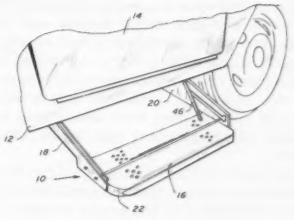
d. a belt switch associated with said belt and having an open position when said belt is in protracted position and a closed position when said belt is in retracted position, said belt switch being connected to the tap of a split coil relay having a plurality of coils connected to said power source through the emitter-collector circuit of a PNP transistor, the base of said transistor being connected to ground through a resistor and said seat switch;

e. circuit means associated with said starter motor and connected to said seat and belt switches through the arm of said split coil relay so as to be grounded when said belt switch is in the closed position for disabling said starter motor while the seat is occupied until the belt is moved from a retracted to a protracted position.

3,883,844
SIGNAL MEANS FOR VEHICLE RETRACTABLE STEP

George F. Wood, II, 2842 E. 26th St., Tulsa, Okla. 74114

Filed Feb. 25, 1974, Ser. No. 445,360
Int. Cl. B60r *3/02*
U.S. Cl. 340—52 R **8 Claims**

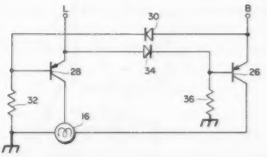


1. In combination with step means for vehicles, said step means being extendable and retractable between a passenger receiving position and a substantially concealed position, signalling apparatus comprising switch means operable by said step means for closing upon extension of the step means into said passenger receiving position and opening upon retraction of the step means into said concealed position, and a signal means operably connected with said switch means for activation upon closing of said switch means to provide indication of the extended position of the step means.

3,883,845
SIGNAL LIGHT ADAPTER FOR TRAILERS

Peter Michael DeVita, 1752 John St., Thornhill, Ontario, Canada

Filed Sept. 10, 1973, Ser. No. 395,932
Int. Cl. B60q *1/00*
U.S. Cl. 340—67 **4 Claims**



1. An electrical signal processing system for a trailer having at least one lamp at its rear left corner and at least one lamp at its rear right corner, each intended to indicate both a brake signal and a respective left or right turn signal; where means is provided in a vehicle intended for towing said trailer, for generating a brake signal on a brake signal line and a turn signal on a turn signal line, where said turn signal comprises a series of voltage pulses at a different level than a system reference voltage so that the visible turn signal indicated by a lamp connected to said turn signal line is a flashing illumination, and said brake signal is a steady voltage at a different level than said system reference voltage so that the visible brake signal indicated by a lamp connected to said brake signal line is a steady illumination; comprising:

means for connecting said at least one lamp at each corner of said trailer to said brake signal line and the respective turn signal line of said towing vehicle;

and a priority signal circuit interposed between each said at least one lamp and said brake line and respective turn signal line for inhibiting a brake signal to said lamp when a turn signal is on said respective turn signal line, including sensing means to sense the presence or absence of a turn signal on said respective turn signal line, said sensing means being operable from the voltage of the signal being senses, and being connected to gate means for inhibiting a brake signal to said lamp so as to impress a voltage derived from said signal being sensed onto said gate means;

said gate means for inhibiting a brake signal to said lamp being such that when a turn signal is sensed by said sensing means, said gate means inhibits said brake signal voltage from being impressed on said lamps;

said priority signal circuit being comprised of elements which become operative and derive their operating power from said brake and signal lines only when signals are generated on said lines from said towing vehicle, said electrical signal processing system remaining otherwise inactive;

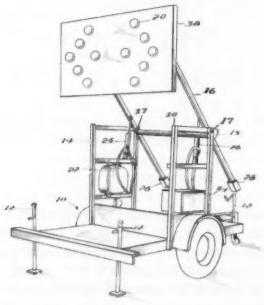
said brake signal line and a turn signal line of said towing vehicle being each respectively connected to a first terminal of a respective first and second switching means, and also to a second terminal on the other of said first and second switching means, the outputs of each of said first and second switching means being connected together to said lamp;

each of said first and second switching means being a transistor whose base is said second terminal; where each said base is connected through a diode to the respective one of said turn signal line or said brake signal line of said towing vehicle, so that each transistor is turned off in the presence of a voltage pulse on said turn signal line and a voltage on said brake signal line.

3,883,846
ADVANCE WARNING TRAFFIC DIRECTION CONTROL SYSTEM FOR USE AT SELECTED ROADWAY SITES

William L. Bruner, London, Ky., assignor to F & B Electronics, London, Ky.

Filed July 13, 1972, Ser. No. 271,494
Int. Cl. B60q *1/24*
U.S. Cl. 340—109 **11 Claims**

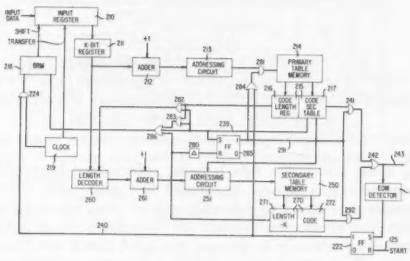


1. An apparatus for supporting a sign panel of signal lights comprising a base; cradle means extending vertically from said base; lift frame means pivotally mounted in said cradle means for movement of one end thereof to selected heights; and a sign panel of signal lights pivotally mounted on said one end of said lift frame means for movement to selected angular positions with respect to said lift frame.

3,883,847
UNIFORM DECODING OF MINIMUM-REDUNDANCY CODES

Amalie Julianna Frank, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1974, Ser. No. 455,668
Int. Cl. H03k *13/24*
U.S. Cl. 340—146.1 R **9 Claims**



1. Apparatus for decoding an ordered sequence of variable-length input binary codewords each associated with a symbol in an N-symbol output alphabet comprising

A. a memory storing a first plurality of words each storing information relating to an output symbol,

B. means for selecting a fixed-length K-bit sample, $K \geq 2$, from said input sequence,

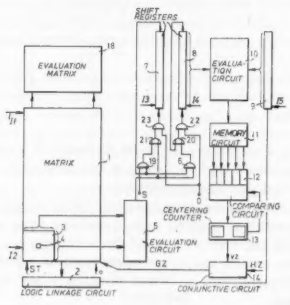
C. means for deriving address signals based on said sample of bits, and

D. means for reading information from the location in said memory specified by said address.

3,883,848
METHOD OF AND CIRCUIT ARRANGEMENT FOR CENTERING A CHARACTER

Konrad Minck, Hegne, and Klaus Joachim, Constance, both of Germany, assignors to LICENTIA Patent-Verwaltungs GmbH, Frankfurt am Main, Germany

Filed Nov. 28, 1972, Ser. No. 310,075
Claims priority, application Germany, Nov. 30, 1971, 2159307
Int. Cl. G06k *9/04*
U.S. Cl. 340—146.3 H **9 Claims**



1. In a method of centering a character, in a character recognition apparatus containing means providing electrical signals constituting a matrix representation of components and background of such character, the centering being in a selected centering direction and relative to a selected ppoint corresponding to a given matrix element, the improvement comprising: evaluating the electrical signals corresponding to

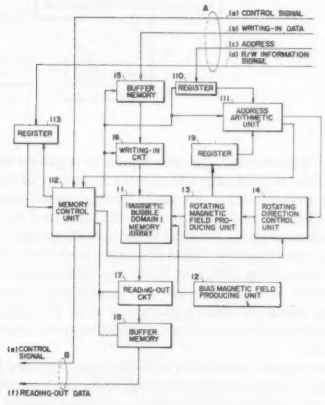
at least a portion of such matrix to provide output signals identifying the location in such matrix portion of points substantially on the center line of a character component which extends transversely to such centering direction; and processing such output signals for forming centering criteria indicative of the location of such center line relative to such selected point along such selected centering direction for proper centering of the character, wherein said step of processing comprises developing signals representing centering criteria of different priorities from such output ssignals, and using the signal representing the centering criterion of highest priority during scanning of a character to effect centering of the character.

3,883,849

MEMORY UTILIZING MAGNETIC BUBBLE DOMAIN DEVICE

Yuzo Kita, and Fumiyuki Inose, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 9, 1973, Ser. No. 349,632
Claims priority, application Japan, Apr. 7, 1972, 47-34363
Int. Cl. G06f *1/00*
U.S. Cl. 340—172.5 **11 Claims**



1. A memory comprising:

a magnetic bubble array having a plurality of magnetic bubble shift loops capable of shifting magnetic bubbles in both directions along the loop, a magnetic bubble generating element for generating magnetic bubbles, and a magnetic bubble sensing element for sensing said magnetic bubbles;

a first register including means for storing the address of the data to be written into the memory array;

a second register including means for storing the address of the position of the bubble generating element on the magnetic bubble memory array;

address arithmetic means including means for comparing the address of the data to be written into the memory array stored in the first register with the address of the position of the bubble generating element on the magnetic bubble memory array stored in the second register and for supplying a directional rotation signal corresponding to the type of non-equal comparision resulting therefrom;

drive means for shifting the magnetic bubbles in a selected direction along the loop by an electric signal applied to the magnetic bubble shift loops; and

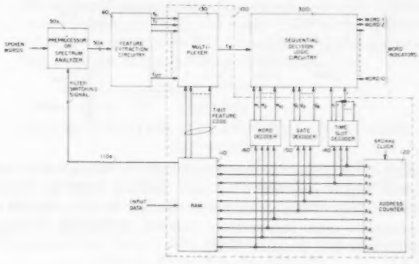
magnetic field rotation direction control means responsive to said address arithmetic means for supplying to said drive means said directional rotation signal which designates the direction in which the magnetic bubbles are to be shifted.

3,883,850

PROGRAMMABLE WORD RECOGNITION APPARATUS

Thomas B. Martin, Burlington, and Marvin B. Herscher, Camden, both of N.J., assignors to Threshold Technology, Inc., Cinnaminson, N.J.

Filed June 19, 1972, Ser. No. 264,232
Int. Cl. G06f *7/04, 15/34;* **G10l** *1/02*
U.S. Cl. 340—172.5 **11 Claims**



1. Apparatus which receives input data representative of speech feature sequences expected to occur characteristically during selected words, and which is programmable thereby to recognize these words when they are subsequently received in spoken form, comprising:

a. feature generating means for processing received spoken words and generating feature output signals on particular ones of a number of feature output lines, the particular ones being dependent upon the features present in a given spoken word;

b. at least one sequential logic chain which includes a plurality of logic units, each logic unit having a logic input line, and each logic unit being activated according to its relative position within the sequential logic chain by the occurrence in sequence of feature output signals on the logic input lines;

c. means for storing the input data for each selected word; and

d. program operable means responsive to the input data stored in said storing means for effectively coupling selected ones of said feature output lines to said logic input lines, the coupling selections being variable and in accordance with the stored input data, such that said sequential logic chain is activated by the particular sequence of feature output signals corresponding to a given selected word.

3,883,851

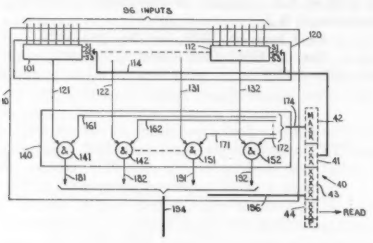
DATA PROCESSING ARRANGEMENTS

John Alfred Drake; Alan James Payne, both of Biggleswade, and Andrew Ronald Reichert, Stevenage, all of England

Filed July 24, 1972, Ser. No. 274,831
Claims priority, application United Kingdom, July 23, 1971, 34683/71
Int. Cl. G05b *11/00*
U.S. Cl. 340—172.5 **4 Claims**

1. A peripheral unit function control device for a data processing system, including a plurality of groups of input lines; a plurality of output lines; means for storing program instructions, each instruction having at least a function field specifying a functional linkage to be set up between input and output lines, an input group selection field and an input mask field; an instruction register arranged to receive a selected instruction from the store; means connected to the instruction register responsive to the input group selection field of an instruction in the instruction register to select a plurality of

input lines, one from each group; gating means responsive to the input mask field to enable only prescribed ones of the selected lines; processing means connected between the selected input lines and the output lines including gated paths arranged to condition the output lines to fulfil a functional



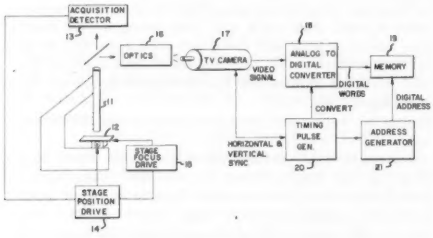
linkage in response to the enablement of input lines; and control means responsive to said function field to render different ones of said gated paths effective to carry signals in dependence upon respectively different functional linkages specified by said function field.

3,883,852

IMAGE SCANNING CONVERTER FOR AUTOMATED SLIDE ANALYZER

Douglas A. Cotter, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 20, 1973, Ser. No. 353,004
Int. Cl. G06f *13/08*; G06r *9/16*
U.S. Cl. 340—172.5 **11 Claims**



1. A system producing stored digital words representing the optical characteristics of an analytical slide comprising:

means for producing an optical image of said analytical slide,

a scanning detector for sequentially scanning at least a portion of said optical image of said slide in a raster of scan lines to produce an analog electrical signal representing said optical image along said scan lines,

an analog to digital converter responsive to a timing pulse input for producing a digital word representing the magnitude of said analog signal at the occurrence of each timing pulse,

an addressable memory for storing each digital word at memory locations specified by a digital address supplied thereto,

a timing pulse generator for generating said timing pulses, said timing pulses being applied to said analog to digital converter at intervals commensurate with the conversion rate at which said analog to digital converter performs each conversion, said conversion rate being matched with the cycle time of said memory, said timing pulses occurring at different times relative to at least two successive scan lines, and

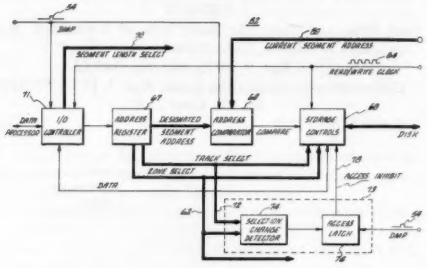
an address generator for generating the digital address at which each digital word is to be stored, said digital address being applied to said memory for storing each digital word.

3,883,853

ADDRESS GENERATOR FOR ROTATING DATA STORAGE DEVICES

Harry C. O'Brien, Thousand Oaks; James V. Rubino, Newberry Park, and Herbert J. Smith, Thousand Oaks, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 2, 1973, Ser. No. 385,145
Int. Cl. G06f *13/04*; G11b *27/20*
U.S. Cl. 340—172.5 **36 Claims**



1. In a data storage system adapted to organize the storage of data into individually addressable segments of tracks on a rotating memory store, the tracks being grouped into a plurality of zones wherein each zone is characterized by a distinct predetermined zone frequency for recording and retrieving data, the zone frequency characterizing each one of said zones being a frequency different from any other zone frequency, said system including means for generating a coded zone selecting signal to select a particular zone for access; an address generator for providing a current segment address which comprises:

means directly assoicated with the memory store for generating a memory store clock signal having a predetermined frequency responsive to the speed of rotation of the memory store wherein the frequency of said memory store clock signal may be higher than all of said zone frequencies, lower than all of said zone frequencies, intermediate any two of said zone frequencies, or substantially equal to any one of said zone frequencies, as desired;

circuit means for deriving a plurality of read/write clock signals from said memory store clock signal, each one of said read/write clock signals comprising a pulse train having a distinct frequency substantially equal to a different one of said zone frequencies whereby each of said read/write clock signals is independently associated with a distinct one of said zones for synchronizing the recording of data in and retrieving of data from segments in the assoicated zone

first counting circuit means for counting the pulses of a read/write clock signal, said first counting circuit means having a modulo equal to the number of bits storable in a segment and generating an output pulse each time the number of read/write clock signal pulses counted therein reaches said modulo;

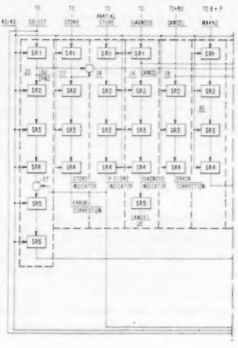
second counting circuit means for accumulating a current segment address therein by counting the output pulses of said first counting circuit means, and

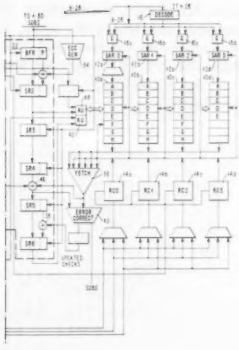
means generating a mark pulse each time the memory store completes a revolution for resetting said first and second counting circuit means in response to each occurrence of said mark pulse.

3,883,854
INTERLEAVED MEMORY CONTROL SIGNAL AND DATA HANDLING APPARATUS USING PIPELINING TECHNIQUES

Gary R. Heinberg; Darryl S. Jones, both of Poughkeepsie, and Thomas R. Wright, Shokan, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 30, 1973, Ser. No. 420,490
Int. Cl. G06f *13/06*
U.S. Cl. 340—172.5 **5 Claims**





1. In an interleaved memory having a plurality of storage units each controlled by timed operating pulses from a separate ring counter driven by a clocking source which determines the intervals at which the storage units can be operated, an improved storage control unit comprising:

a. a first plurality of multi stage shift registers driven by said clocking source for receiving control information;

b. a second plurality of multi stage storage registers driven by said clocking source for receiving data to be stored into the interleaved memory so that the data will be stepped along with the control signals;

c. means for supplying a control signal to at least the ring counter supplying operating pulses to the storage unit of interleaved memorys being accessed and to the shift registers to start the ring counter and the shift registers so that as a result of the shift registers being driven by the same clocking source as the ring counter the shift registers and ring counter operate in synchronism;

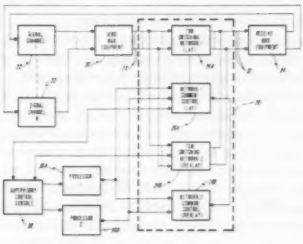
d. gate means coupling selected stages of the second plurality of storage registers to the interleaved memory to permit data in the second plurality of storage registers to pass through said gate means and into the accessed storage unit of the interleaved memory if the gates are open when said data is at said selected stages; and

e. logic means coupling the gate means to selected stages in first plurality of shift registers for opening the gate means to permit the passage of data at a selected stage of said second plurality of shift registers into the accessed memory unit only at those times that control information in the selected stages of the first plurality of shift registers indicates data at a selected stage in the second plurality of shift registers should be entered into the accessed memory unit of the interleaved memory.

3,883,855
CONTROL SYSTEM FOR A DIGITAL SWITCHING NETWORK

Barrie Brightman, Webster; George Datsko, Rochester, both of N.Y.; Edward W. Moll, King of Prussia, Pa., and William H. Stewart, Scio, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Division of Ser. No. 401,534, Sept. 27, 1973. This application Apr. 5, 1974, Ser. No. 458,382
Int. Cl. H04j *3/02, 3/00*
U.S. Cl. 340—172.5 **10 Claims**



1. A control circuit for controlling the translation from line time slots to switching time slots of digital time divided multiplex signals by a memory circuit, wherein the control circuit receives from a processor and stores parallel binary input control data corresponding to line time slot addresses and transmits parallel binary output data to said memory in a changeable sequence, said control circuit comprising:

a plurality of recirculating memories, a separate one for each parallel bit of digital control data to be received, said recirculating memories having a plurality of serial storage locations corresponding to said switching time slots continually circulating in synchronism between the input and output thereof;

write circuit means responsive to a write enabling signal for simultaneously storing parallel binary input control data in corresponding storage locations in each of the recirculating memories;

time slot means for determining to which switching time slot an individual line time slot will be translated and for providing a said write enabling signal at the determined switching time slot;

erase circuit means responsive to an erase enabling signal for simultaneously erasing any digital information stored in corresponding storage locations in said recirculating memories; and

transmit circuit means for simultaneously transmitting output data in parallel binary form from corresponding storage locations in said recirculating memories to the memory circuit, wherein said digital time divided multiplex

signals are written into the memory sequentially at said line time slots and read from the memory according to the transmitted sequence of parallel binary output data.

3,883,856

PROGRAM INPUT SYSTEM USING A MEMORY CASSETTE

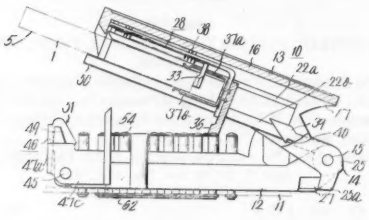
Etsuro Saito, Atsugi, and Shooichi Matsui, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 12, 1973, Ser. No. 323,254

Claims priority, application Japan, Jan. 31, 1972, 47-13509[U]; Jan. 31, 1972, 47-13510[U]; Jan. 31, 1972, 47-13511[U]

Int. Cl. G11c *17/00*; **G06k** *7/06*, *19/00*

U.S. Cl. 340—173 SP **11 Claims**



1. A memory cassette, comprising:

a housing formed of a top wall, a bottom wall and a plurality of side walls joining the top and bottom walls to thereby define a cavity within said housing; and

a circuit board disposed within said cavity, said circuit board having memory circuit elements and electric contacts connected to said memory circuit elements;

at least one of said top and bottom walls having differently dimensioned apertures therein aligned with corresponding circuit board electric contacts so that said corresponding circuit board electric contacts are visible through said apertures and said apertures are adapted to receive external electrical connecting means that are insertable therethrough into electric contact with said corresponding circuit board electric contacts.

6. A program input apparatus for receiving an electronic memory cassette of the type having a substantially flat housing, electronic circuits within the housing and electrical contacts connected to the electronic circuits and exposed in a pattern on the exterior surface of the cassette housing, the program input apparatus comprising a base plate, a frame pivoted on the base plate and rotatable between an open and a closed position, means within the frame for receiving the cassette including a cassette carrier movably mounted within the frame, and electrical contacts on the base plate arranged in a pattern corresponding to the pattern of the cassette contacts to form electrical connections between the respective base contacts and the corresponding respective cassette contacts when the frame is in its closed position.

3,883,857

DIGIT REGENERATION IN TWO-OUT-OF-FIVE FORMAT CODE SYSTEMS

Stig E. Magnusson, Chicago, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

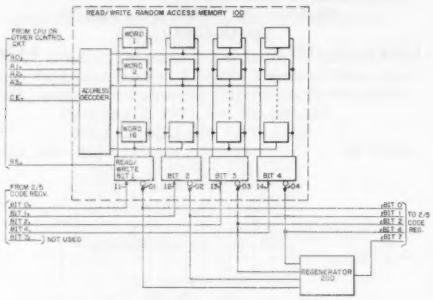
Filed Apr. 1, 1974, Ser. No. 456,585

Int. Cl. G11c *13/00*

U.S. Cl. 340—173 R **6 Claims**

1. A memory system connected between, a source of five element coded signals and an output circuit, and including circuit connections to a control circuit, said memory system comprising:

storage means initially operated in response to said control circuit to store four elements of each of said coded signals from said signal source and further operated in response to said control circuit to readout said four stored elements; regeneration means connected between said storage means and said output circuit, operated in response



to said four elements readout of said storage means to regenerate the fifth element of each coded signal, and transmit said fifth element to said output circuit;

and said output means operated in response to the combination of said four elements of said coded signals readout of said storage means and said fifth element of said coded signals received from said regeneration means.

3,883,858

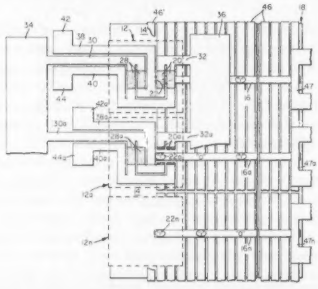
MAGNETORESISTIVE READOUT TRANSDUCER FOR SENSING MAGNETIC DOMAINS IN THIN FILM MEMORIES

Heinz Lienhard, Greifensee, Switzerland; Walter S. Carter, Ruislip, England, and Irving W. Wolf, Palo Alto, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Dec. 17, 1973, Ser. No. 424,924

Int. Cl. G11c *11/14*, *19/00*

U.S. Cl. 340—174 EB **2 Claims**



1. A magnetoresistive readout system for integral disposition with readout regions of respective storage channels in a thin film storage device including first and second magnetoresistive element means formed of respective magnetoresistive thin films integrally disposed within the thin film storage device, comprising the combination of:

said first magnetoresistive element means including a pair of active magnetoresistive thin film elements disposed in magnetic field coupling relation with a selected readout region of a respective storage channel;

said second magnetoresistive element means including a pair of balance magnetoresistive thin film elements electrically coupled to the pair of active magnetoresistive thin film elements to define a balanced bridge configuration:

wherein the bridge generates a bipolar read signal in direct response to the passage of a magnetic domain adjacent only the active elements; said second balance elements being sufficiently spaced from any storage channels to have no magnetic coupling with any magnetic domains;

readout circuit means coupled to the bridge defined by the active and balance pairs of elements for generating a logic output indicative of the presence and the absence of magnetic domains in magnetic coupling relation with only the active elements;

said readout circuit means including strobe means for selectively sampling the output of the bridge only during a time window commensurate with passage of the domain adjacent the pair of active elements, and differential amplifier means to provide a signal magnitude equal to the difference between the positive and negative values of the bipolar read signal generated during said time window and for generating binary logic output signals indicative of the presence or absence of a domain adjacent only the active elements.

3,883,859

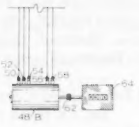
LOAD HEIGHT INDICATION

Edward F. Ancheta, 2244 Jennie St., Honolulu, Hawaii 96819

Filed Dec. 29, 1972, Ser. No. 319,746

Int. Cl. B66c *13/46*

U.S. Cl. 340—267 C **5 Claims**



1. Load height indicating apparatus for tower cranes having a base, a column extending upward from the base, a jib extending horizontally from the column and mounted for rotation on the column, rotating means connected to the jib and to the column for rotating the jib on the column, a trolley mounted on the jib for selectively positioning on the jib, propelling means connected to the jib and to the trolley for moving the trolley on the jib, hoisting means connected to the trolley for lifting loads, and load engaging means connected to the hoisting means for engaging and holding loads on the hoisting means below the trolley, and control means connected to the rotating means, to the propelling means and to the hoisting means for separately controlling those means, the improvement comprising measuring means connected to the hoisting means for determining the condition of the hoisting means and thus determining position of the load engaging means with respect to the trolley, telemetering means connected to the measuring means for telemetering condition of the measuring means, and indicator means connected to the telemetering means and mounted near the control means for indicating condition of the measuring means and hence position of the load.

3,883,860

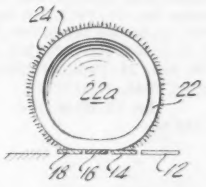
ELECTRIC INDICATOR SYSTEM FOR BALL GAMES

Henry von Kohorn, Greenwich, Conn., assignor to John J. Schlager, Springfield, N.J.

Filed Nov. 8, 1973, Ser. No. 413,761

Int. Cl. G08b *21/00*

U.S. Cl. 340—323 **10 Claims**



1. An electric out ball indicator system for a ball and court game comprising

a. a non-conductive playing area defined by court lines,

b. at least two spaced parallel, current-conductive strips adjacent to said court lines and exterior to said playing area,

c. an insulating strip located between said spaced, current-conductive strips,

d. an electric power source connected to said current-conductive strips, and

e. an electric indicator,

wherein said a–e define an open electrical circuit; said system further containing a ball provided with current-conductive fibers on its outer surface, such that an out ball will close said open circuit and activate said indicator when contact is made between said current-conductive fibers of said ball and said spaced, current-conductive strips so as to close said open electrical circuit.

3,883,861

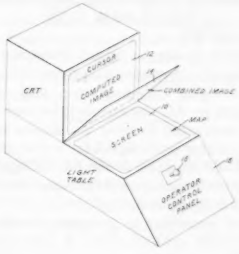
DIGITAL DATA BASE GENERATOR

Robert A. Heartz, Deland, Fla., assignor to General Electric Company, New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 415,253

Int. Cl. G08b *5/36*

U.S. Cl. 340—324 R **4 Claims**



1. A digital data base generator comprising:

memory means for storing in digital form a data base descriptive of a selected land mass;

display means for displaying a selected portion of the data base in graphic form;

comparison means for comparing the displayed selected portion of the data base with a graphic depiction of land mass information from another source related to said selected portion of the data base; and

control means for modifying said data base.

3,883,862

SIGNAL COLLECTING AND DISTRIBUTING SYSTEMS

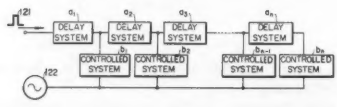
Jun-Ichi Nishizawa; Ichiemon Sasaki; Katsuhiko Ishida, all of Sendai; Syoji Tauchi, Kokubunji; Takeshi Nishimura, Tokyo; Takeo Seki, Kokubunji, and Noboru Kozuma, Tokyo, all of Japan, assignors to Semiconductor Research Foundation and Hitachi, Ltd.

Division of Ser. No. 216,532, Jan. 10, 1972, which is a division of Ser. No. 616,385, Feb. 15, 1967, Pat. No. 3,634,849. This application Nov. 21, 1973, Ser. No. 418,129

Claims priority, application Japan, Feb. 19, 1966, 41-9987; Mar. 12, 1966, 41-15163; Mar. 25, 1966, 41-18324; Apr. 2, 1966, 41-20528; Apr. 25, 1966, 41-25890; Apr. 25, 1966, 41-25891; Apr. 25, 1966, 41-25892

Int. Cl. H04n *1/04*

U.S. Cl. 340—324 M **15 Claims**



1. A switching control system comprising:

a plurality of spaced controllable signal elements,

a switching means connected to said signal elements for actuating said elements in a predetermined sequential order including an active transmission line capable of attenuationless propagation at a constant rate including a plurality of transmission elements connected in tandem, each transmission element being connected to a respective signal element and including a negative resistance device capable of reshaping and amplifying said switching signals, and

generator means connected to said transmission line for applying switching signals thereto,

control signal generator means connected to said electroluminescent devices for providing a plurality of signals for selectively controlling said devices.

3,883,863

INTEGRATING ANALOG TO DIGITAL CONVERTER WITH VARIABLE TIME BASE

Frank G. Willard, Pitcairn, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1973, Ser. No. 402,684

Int. Cl. H03k *13/20*

U.S. Cl. 340—347 NT **22 Claims**

1. A dual slope analog to digital converter to convert an analog input signal in response to a conversion request signal generated by a digital data processor, said converter being adapted to reject an AC voltage superimposed on an analog voltage to be converted forming the analog input signal by integrating the analog input signal for a time interval equal to an integer number of cycles of the AC voltage, comprising:

an integrator to integrate and decrease the integral of the analog input signal to zero;

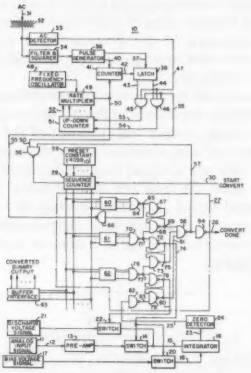
a clock signal generator to generate a series of repetitive pulses;

a sequence counter to count generated clock signal pulses and generate signals in accordance with the counted pulses;

means to detect the time period of each cycle of the AC voltage;

means to control the repetition rate of the clock signal pulses to cause a distinct number of clock signal pulses to occur during a detected AC cycle time period, the conversion request signal being generated at a time independent of the beginning of a detected AC cycle; and

means responsive to the signals generated by the sequence counter to govern the integrator to commence integrating an analog input signal in response to the conversion request signal and to continue such integration for a time interval during which the sequence counter counts the distinct number of clock signal pulses, to discharge the



integrator thereafter at a constant rate until the output signal of the integrator reaches a predetermined level, and to generate signals representative of the number of clock signal pulses counted by the sequence counter during discharge of the integrator.

3,883,864

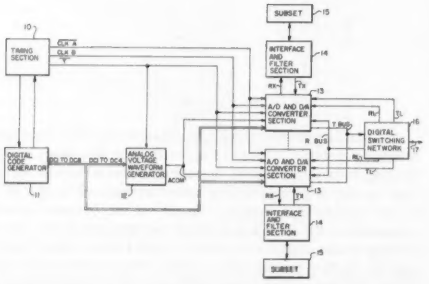
ANALOG-TO-DIGITAL AND DIGITAL-TO-ANALOG CONVERTER APPARATUS

Robert M. Thomas, Maitland, Ontario, Canada, assignor to GTE Automatic Electric (Canada) Ltd., Brockville, Ontario, Canada

Filed Feb. 22, 1974, Ser. No. 444,890

Int. Cl. H03k *13/17*

U.S. Cl. 340—347 AD **7 Claims**



1. Analog-to-digital and digital-to-analog converter apparatus comprising

digital code generating means for producing a sequence of digital code signals during a comparison period of each operating cycle;

analog voltage generating means for producing an analog voltage waveform during the comparison period of each operating cycle and being synchronized with said digital code generating means whereby for each digital code signal a corresponding analog voltage signal is produced at the same instant during the comparison period of each operating cycle;

analog input signal storage means for storing an analog input signal prior to a comparison period;

analog comparison means coupled to the analog input signal storage means and to the analog voltage generating means for comparing the stored analog input signal with said analog voltage waveform during a comparison period and for producing an output signal when the voltage of the analog voltage waveform is equal to the stored analog input signal;

digital storage means coupled to the digital code generating means and to the analog comparison means for storing a digital signal equal to the digital code signal being produced by the digital code generating means in response to an output signal from the analog comparison means whereby a digital signal corresponding to the voltage of the stored analog input signal is stored in the digital storage means during the comparison period;

digital input signal storage means for storing a digital input signal prior to a comparison period;

digital signal comparison means coupled to the digital input signal storage means and to the digital code generating means for comparing the stored digital input signal with said sequence of digital code signals during a comparison period and for producing an output signal when the two digital signals are equal; and

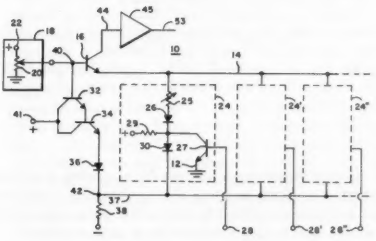
analog storage means coupled to the analog voltage generating means and to the digital signal comparison means for storing an analog signal equal to the analog signal being produced by the analog voltage generating means in response to an output signal from the digital signal comparison means whereby an analog signal corresponding to the stored digital input signal is stored in the analog storage means during the comparison period.

3,883,865

D TO A CONVERTER WITH HIGH-SPEED, TRANSIENT-REE SWITCHING CIRCUITRY

John C. Freeborn, West Covina, Calif., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 30, 1974, Ser. No. 437,908
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 DA **10 Claims**



1. In a digital-to-analog converter of the type wherein current in a conductor at a positive reference voltage is selectively conducted to ground through at least one of a plurality of parallel branches, each comprising a resistor connected to the conductor and a first NPN transistor having its emitter connected to ground, the improvement which comprises:

a first diode in series with the resistor and the transistor so that its anode is connected to the resistor and its cathode is connected to the collector of the transistor;

bias means for biasing the collector of the transistor to a voltage more positive than the positive reference voltage; and

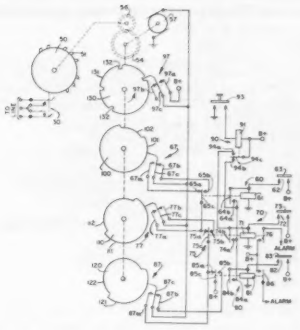
clamping means for limiting the voltage at the collector of the transistor to a voltage no more positive than necessary to prevent conduction through said first diode.

3,883,866

ALARM GENERATOR

John K. Kneeland, Mill Ln., Old Lyme, Conn. 06371

Filed Aug. 14, 1973, Ser. No. 388,225
Int. Cl. G08c *1/00*
U.S. Cl. 340—356 **11 Claims**



1. An alarm generator adapted to be located on a premises to be protected against the occurrence of a plurality of events, and supervised at a point remote from the premises, comprising means for producing at least one code signal for transmission to the remote point, a rotatably mounted code wheel programmed to cause said producing means to produce a predetermined code signal for each revolution of said code wheel, a motor for rotating said code wheel, a plurality of switching means for coupling power to said motor, a plurality of event inputs each providing an enabling voltage in response to occurrence of one of the plurality of events, said switching means being respectively coupled to said plurality of event inputs and each being responsive to the presence of the associated enabling voltage to couple the power to said motor, a plurality of control mechanisms respectively coupled to said plurality of switching means and operatively coupled to said motor, each of said control mechanisms having means responsive to a predetermined rotation of said motor to operate said switching means to stop said motor, whereby said code wheel is caused to rotate a number of revolutions corresponding to the predetermined rotation of said motor, and reset means for causing said switching means to deliver power to said motor, each of said control mechanisms having further means responsive to a further predetermined rotation of said motor to stop said motor, whereby said code wheel is caused to rotate a further number of revolutions corresponding to the further predetermined rotation of said motor.

3,883,867

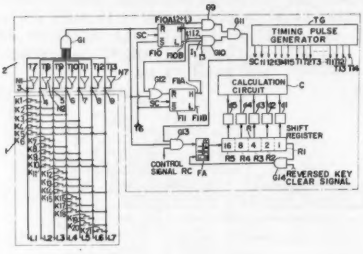
INFORMATION INPUT DEVICE

Isao Hatano, Kyoto; Akira Nagano, Nagaokakyo, and Kazuaki Urasaki, Mukou, all of Japan, assignors to Omron Tateisi Electronics Co., Japan

Filed Apr. 4, 1973, Ser. No. 347,657
Claims priority, application Japan, May 4, 1972, 47-33629
Int. Cl. H04l *15/06*
U.S. Cl. 340—365 R **3 Claims**

1. An information input device which comprises means for generating a plurality of timing signals in different timings, a plurality of input lines connected with said generating means for respectively receiving the timing signals generated thereby, a plurality of key contacts, each of said key contacts being connected between a different pair of said input lines and operable in response to an external instruction applied thereto, a first NAND gate connected with each of said input lines, a first flip-flop being set by one of said timing signals and

reset by an output from said first NAND gate, a second flip-flop being set by said one of said timing signals and reset by said output from said NAND gate generated after said first flip-flop has been set, a second NAND gate having a first terminal adapted to receive a bit timing signal having the 2^1s and 2^2s weights and a second terminal adapted to receive a set output from said first flip-flop, a third NAND gate adapted to receive a reset output from said first flip-flop, a set output from said second flip-flop and a bit timing signal having the 2^0



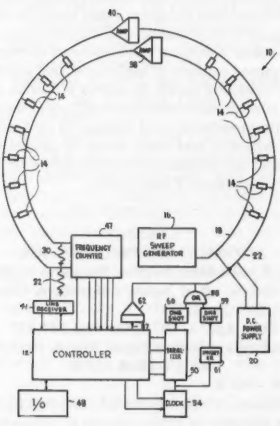
s weight, a fourth NAND gate adapted to receive an output from said second NAND gate and an output from said third NAND gate, a first AND gate adapted to receive an output from said fourth NAND gate, a full adder adapted to receive an output from said first AND gate, a shift register for storing an output from said full adder, gating means for supplying an output from said shift register to said full adder independent of said output from said first AND gate, and gating circuit for reading out the content stored in said shift register.

3,883,868

SWEEP FREQUENCY CONTROL APPARATUS AND METHOD

Ronald S. Palmer, 5784 Herma, San Jose, Calif. 95123

Filed July 23, 1973, Ser. No. 381,837
Int. Cl. H04n *7/10*
U.S. Cl. 340—408 **10 Claims**



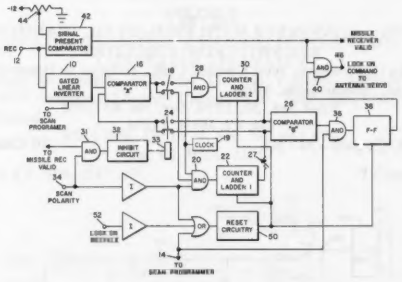
1. Apparatus for controlling the operation of a plurality of spaced, independent, actuatable mechanisms comprising: a control module for each mechanism, respectively, each module having first means permitting an enabling device capable of resonanting at a predetermined frequency to be inductively coupled thereto; a sweep generator operable to provide an output signal whose frequency varies successively over a range of frequencies; first conductor means common to the modules for coupling the sweep generator thereto to permit said output signal to be applied simultaneously to the modules, each module having second means thereon responsive to said output signal when the module is inductively coupled to an enabling device and when the output signal has the frequency at which the corresponding enabling device resonates for generating a first signal indicating the inductive coupling between the module and the enabling device and indicating the resonant condition of the last-mentioned enabling device, each module having third means responsive to a second signal for actuating the corresponding mechanism; a central controller; and second conductor means common to said modules for connecting said controller thereto to permit said controller to receive a first signal from a module, said controller being operable to successively address the modules and to generate a second signal after a first signal has issued from a module, said second conductor means being operable to direct the second signal to the third means of a module to actuate the corresponding mechanism.

3,883,869

ACQUISITION LOGIC CIRCUITRY

Peter M. Buccieri, Bridgeport, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 2, 1970, Ser. No. 128,599
Int. Cl. G01s *7/02*
U.S. Cl. 343—7 A **3 Claims**



1. In an acquisition logic circuit for acquiring a radiating source with a tracking antenna the combination comprising:

a. a first comparator circuit having a first input coupled to a signal source and having a second input and an output;

b. a first counting circuit having an input and an output;

c. a second counting circuit having an input and an output;

d. switch circuit means coupled to said first comparator circuit and to said first and second counting circuits for successively comparing the outputs of said first and second counting circuits with the input of said first comparator circuit;

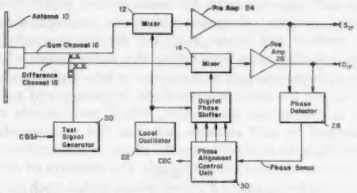
e. second comparator circuit means having a first input coupled to the output of said first counter and a second input connected to the output of said second counter and generating an output signal when said two inputs are equal;

f. an AND circuit having a first input coupled to the output of said second comparator circuit and having a second input coupled to a valid signal indicator for producing an output signal representing alignment of the missile antenna with the radiating source.

3,883,870
SYSTEM FOR PHASE ALIGNING PARALLEL SIGNAL PROCESSING CHANNELS

William J. Kunz, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 17, 1973, Ser. No. 426,289
Int. Cl. G01s *7/40*
U.S. Cl. 343—17.7 **4 Claims**



1. A system for automatically phase aligning two signal processing channels of the type which includes a mixer for frequency translation and a local oscillator coupled to the mixer in each processing channel; said system comprising:

test generator means for applying test signals, having a preselected phase relationship, to the input section of each processing channel;

phase detector means coupled to the output section of each said processing channel for providing a binary phase sense signal indicative of whether the phase between the channels' output signals is more or less than a preselected value;

a digitally controllable phase shifter coupled between the local oscillator and the mixer of one of said signal processing channels; and

control means coupled to said phase shifter and responsive to said phase sense signal, for controlling the phase shift of the local oscillator's output signal applied through said phase shifter so as to cause a preselected phase relationship between the output signals from said two processing channels; said control means including an up/down counter, first logic means for causing said counter to count up when said binary phase sense signal is of one state and to count down when said binary phase sense signal is of the other state, and second logic means for sensing the change of states of said binary phase sense signal and for inhibiting counting by said up/down counter after a preselected number of said binary signal state changes have been sensed; and means for applying the output signals from said up/down counter to said phase shifter so that the phase shift applied to the local oscillator's output signal by said phase shifter is controlled as a function of the count held in said up/down counter.

3,883,871
METHOD AND MODULATION SYSTEM FOR AMBIGUITY REDUCTION IN PULSED RADAR

Randolph G. Moore, 3836 N. 60th Pl., Phoenix, Ariz. 85251

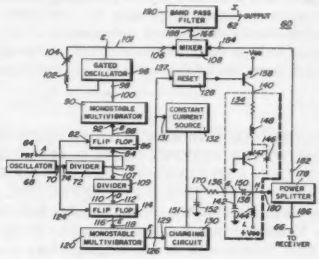
Filed Mar. 12, 1973, Ser. No. 340,501
Int. Cl. G01s *9/23*
U.S. Cl. 343—17.2 R **25 Claims**

1. A modulation code generator for use in a pulsed radar system to shift some of the unwanted ambiguity peaks off of the time axis, including in combination:

first oscillator means providing a pulse modulated signal at an output terminal thereof, said pulse modulated signal having a pulse repetition rate;

second oscillator means providing a frequency modulated signal at an output terminal thereof, said frequency modulated signal having a frequency deviation which is a multiple of said pulse repetition rate of said pulse modulated signal; and

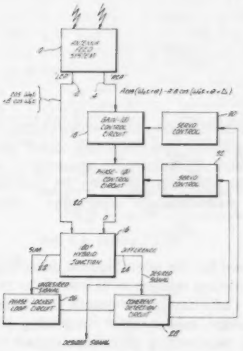
signal combining means having an output terminal, a first input terminal connected to said output terminal of said first oscillator means and a second input terminal connected to said output terminal of said second oscillator means, said signal combining means combining said pulse modulated and said frequency modulated signals to provide an output signal at said output terminal thereof during the times that said pulse modulated and said frequency modulated signals simultaneously exist, said output signal being suitable for transmission by a radar system and for shifting some of the unwanted ambiguity peaks off of the time axis.



3,883,872
SYSTEM FOR INTERFERENCE SIGNAL NULLING BY POLARIZATION ADJUSTMENT

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; John E. Ohlson, Marina, and William F. Williams, Torrance, both of Calif.

Filed June 28, 1973, Ser. No. 374,422
Int. Cl. H04b *7/00*
U.S. Cl. 343—100 PE **14 Claims**



1. A receiving system for selecting a desired one of two orthogonally polarized signals occupying the same bandwidth, said receiving system including:

an orthomode antenna having two output ports at which components of said two orthogonally polarized signals are provided;

a hybrid junction having a pair of input terminals for respectively receiving signals from the two output ports of said

orthomode antenna, and sum and difference output terminals at which are respectively provided a sum signal representing the sum of the signals applied to said hybrid junction and a difference signal representing the difference of the signals applied to said hybrid junction;

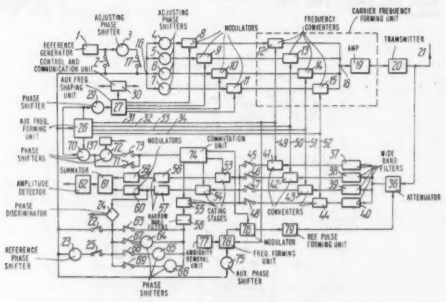
detection means for coherently detecting the presence of components of the undesired one of said two orthogonally polarized signals that may appear in said difference signal, said detection means providing error signals; and

adjustment means responsive to said error signals for automatically nulling said components of said undesired signal to have said difference signal continually represent the desired one of said orthogonally polarized signals.

3,883,873
METHOD OF UNAMBIGUOUS DETECTING THE POSITION OF MOVING OBJECT, ALSO GROUND STATION AND RECEIVER DISPLAY OF RADIO NAVIGATION SYSTEM FOR EFFECTING SAME

Evgeny Alexandrovich Mosyakov, Zvezdny bulvar, 1, kv. 28; Jury Vasilievich Rtischev, Sevasto-polsky prospekt, 34, kv. 18; Efim Zakharovich Berer, Volgo-gradsky prospekt, 135. korpus 1, kv. 45; Vladimir Markovich Leus, Novo-Kuzminskaya 16, korpus 1, kv. 129; Viktor Petrovich Lukeev, Polyarnaya ulitsa, 9, korpus 4, kv. 416; Evgeny Markovich Rodionov, Avangardnaya ulitsa, 22/32, kv. 115; Vladimir Lvovich Levitsky, 2 Mosfilmovsky pereulok, 3, kv. 24; Vladimir Surenovich Akopyan, B. Gnezdnikovsky pereulok, 10, kv. 730; Jury Yakovlevich Mindlin, Kolokolnikov pereulok, 12, kv. 29; Evgeny Ivanovich Balashov, Prospekt Vernadskogo, 111, kv. 88; Isaak Efimovich Kinkulkin, Lavrushinsky pereulok, 17, kv. 15; Galina Petrovna Shumakova, Kolomensky proezd, 1/1, korpusa, kv. 90, all of Moscow; Evgeny Tikhonovich Fedotov, 3 Tsvetochny pereulok, 3, Balashikhinsky raion, poselok Saltykovka, and Vladimir Fedorovich Lazarev, ulitsa Butlerova, 10, kv. 247, Moscow, all of U.S.S.R.

Filed Nov. 1, 1972, Ser. No. 302,814
Int. Cl. G01s *1/24*
U.S. Cl. 343—103 **10 Claims**

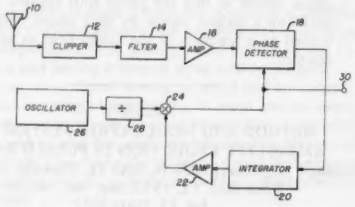


1. A method for the unambiguous detecting of the position of a moving object relative to at least three stationary ground stations of a radio navigation system, one station thereof being the main station, said method comprising generating at said stations and transmitting therefrom signals alternately in the form of long trains comprising a multitude of successive groups of radio pulses with various carrier frequencies and a repetition interval, which depends only on the delay time of the radio pulses reflected by the ionosphere, the repetition frequency of transmitted radio pulses being equal to the frequency at which the most coarse determination of the position of a moving object is effected, the phases of signals on various carrier frequencies being in constant relationship upon transmission; the main station being caused to transmit additionally a synchronizing signal within the spaces between the radio pulses of fundamental signals which carry phase information while the long pulse train of synchronizing signal is being transmitted; said synchronizing signal determining the sequence of transmission of said trains by the stations in a general transmission cycle, said radio pulses generating an electromagnetic field with predetermined frequency and phase relationships; said long trains, as well as the signals reflected by the ionosphere, being received by a receiver-display which determines the sequence of transmissions of pulse trains by the stations in the general cycle resorting to the synchronizing signal, performs a search for radio pulses within each long train and division of signals into waves propagated over the earth surface and waves reflected by the ionosphere; said receiver-display then converting the radio pulses of surface waves with various carrier frequencies into undamped oscillations having the same intermediate frequency and a duration equal to that of the long trains, which corresponds to those transmitted by said stations, whereas the relative phases of said oscillations depending on the phase of transmitted signals; said receiver-display executing also the measure of difference in phase between said I.F. oscillations within each long train, said difference in phase being equivalent to the phase of signals at the beat frequency of two carrier frequencies; said receiver-display then effecting the measurements of the difference in phase of radio pulses at repetition frequency and the difference between said differences in phase of I.F. oscillations, the two being obtained within different long trains for removing any possible ambiguity and defining accurately the position of a moving object by using the difference in phase between said I.F. oscillations obtained on one of the carrier frequencies within various of the long trains, determining according to said synchronizing signal the sequence of transmission of pulse trains by the station in the general cycle, then in the range of each long train of radio pulses are being searched, said signals being divided into signals propagating over the earth surface and signals reflected by the ionosphere, the signal phase on one of the carrier freequencies measured, the phase difference of two signals determined on one of the carrier frequencies, the difference being used for detecting the exact position of a moving object, signal phases being compared on beat frequencies and radio pulse repetition frequency, the comparison result being used for removing ambiguity of position of a moving object.

3,883,874
SYSTEM FOR PROVIDING A REFERENCE FREQUENCY SOURCE

Eric R. Swanson, 640 Sinergate Ave., San Diego, Calif. 92106

Filed Sept. 28, 1973, Ser. No. 401,732
Int. Cl. G01s *1/30*
U.S. Cl. 343—105 R **1 Claim**



1. Standard frequency apparatus comprising:

antenna means for receiving VLF signals transmitted from a number of remote sources;

clipper means connected to the output of said antenna means, filter means connected to the output of said clipper means and amplifier means connected to the output of said filter means, said serially connected clipper, filter and amplifier means being responsive to said VLF signals to produce a first signal at a frequency f_1;

oscillator means for producing a second signal at a frequency f_2;

phase detector means having a first input connected to the output of said amplifier means, a second input and an output;

phase shifter means having a first input connected to the output of said oscillator means, a second input and an output, integrator and amplifier means connecting the output of said phase detector means to the second input of said phase shifter means, said phase shifter output ($f_2 \pm \Delta f$) being connected to the second input of said phase detector means whereby when $f_1 = f_2 \pm \Delta f$, the output of said phase detector is equal to zero; and,

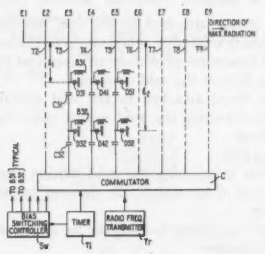
output terminal means connected to the output of said phase shifter means to produce said standard frequency when $f_2 \pm \Delta f = f_1$.

3,883,875

ENDFIRE COMMUTATED ANTENNA ARRAY

Ian W. McClymont, and Sharad V. Parekh, both of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,956
Int. Cl. G01s *1/38*
U.S. Cl. 343—106 D **5 Claims**



1. A Doppler navigation beacon system having a commutated linear array of n radiator elements for radiating in substantially equal radiation patterns during the successive excitation of corresponding elements of said array, comprising the combination of:

transmitter means for generating a radio frequency signal;

radio frequency energy commutator means for discretely switching said radio frequency signal among at least a first portion of said elements according to a predetermined sequence, said elements thereby becoming driven elements;

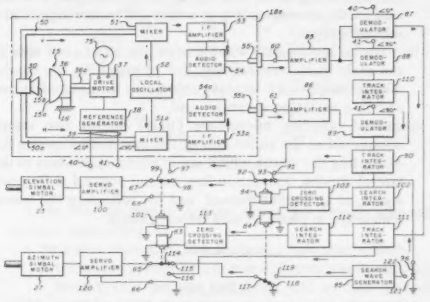
and switching means operating synchronously with said commutator means, for causing an element of said array adjacent to the driven element at any time, to act as a reflecting element, said switching means also operating to cause a second portion of the other elements of said array to be substantially electrically transparent, said driven elements thereby providing substantially equal radiation patterns maximized in the direction opposite said reflecting element with respect to each excited element.

3,883,876

HIGH FREQUENCY RADIOMETRIC TARGET SEEKING AND TRACKING APPARATUS

Robert S. Roeder, Dunedin, Fla., and David S. Siegel, Silver Springs, Md., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 5, 1972, Ser. No. 215,694
Int. Cl. G01s *5/02*
U.S. Cl. 343—117 R **8 Claims**



1. In a high frequency target detector system having antenna means for conically scanning about a boresight direction coupled to receiver means for generating error signals representing the deviation of said boresight direction from said target:

means responsive to said receiver means for causing said antenna means automatically to search in elevation and to locate the natural high frequency noise maximum proximate the earth's horizon,

means responsive to said receiver means for causing said antenna means to lock on said noise maximum for automatically tracking said noise maximum in elevation,

means responsive to said receiver means for causing said antenna means automatically to search and locate in azimuth a target while automatically tracking said noise maximum,

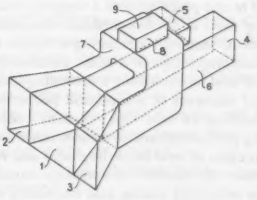
means responsive to said receiver means for causing said antenna means automatically to lock on said target for automatically tracking said target in azimuth while automatically tracking said noise maximum in elevation, and means responsive to said receiver means for causing said antenna means automatically to track said target in azimuth and elevation.

3,883,877

OPTIMIZED MONOPULSE ANTENNA FEED

Maurice Chabah; Yves Commault, and Yves Campan, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 20, 1974, Ser. No. 444,147
Claims priority, application France, Feb. 23, 1973, 73.06564
Int. Cl. H01q *13/00*
U.S. Cl. 343—778 **12 Claims**



1. In an antenna system, an optimized monopulse feed for supplying at three outputs a sum signal Σ and two difference

signals ΔE and ΔH respectively which are a function of the angular deviation of an object in space with respect to the axis of the antenna, comprising:

a rectangular main waveguide for propagating simultaneously at least the fundamental mode and one odd mode, said main guide terminating at one end in a radiating aperture;

a first coupling microwave circuit coupled to the other end of said main guide for extracting said fundamental mode corresponding to the sum signal, at a first output, and said odd mode corresponding to a first difference signal, at a second output;

two lateral rectangular wave guides placed at each side of the main guide respectively, for propagating the fundamental mode, each lateral guide being terminated at one end in a radiating aperture, and,

a second coupling microwave circuit having two inputs connected at the other end of the two lateral guides for extracting the waves which are in phase opposition in the lateral guides, corresponding to the second difference signal, at an output thereof, and for reflecting the waves which are in phase in said lateral guides.

3,883,878

METHOD AND APPARATUS FOR RECORDING THE NUMBER OF PHENOMENA

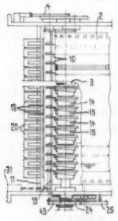
Paul Bommer, Zumbach Electronic-Automatic, CH-2552 Orpund, Switzerland

Filed Apr. 6, 1973, Ser. No. 347,320

Claims priority, application Switzerland, Apr. 10, 1972, 5258/72

Int. Cl. G01d *9/30*

U.S. Cl. 346—1 **15 Claims**



1. A method for recording of the number of phenomena occurring in different places during succeeding recording periods onto a recording tape, comprising the steps of producing an electric signal by each phenomenon, transmitting signals produced in one place each to a stepping relay, advancing said recording tape in its longitudinal direction after each recording period, stepwise advancing a control element by each of said stepping relays in a plane parallel to the advancing direction of said tape, shifting a recording element by each of said control elements in a direction perpendicular to the advancing direction of said tape, thereby recording during each recording period records in a direction transverse to the advancing direction of said recording tape and resulting each from the addition of a number of unit steps equal to a number of phenomena occurring during said recording period in one of said places, the total length of each record in transverse direction corresponding to said number of phenomena occurring in one of said places.

3,883,879

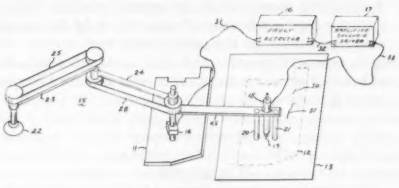
PORTABLE PANTOGRAPH C-SCAN RECORDING FLAW DETECTING SYSTEM

Donald D. Kettering, Stony Brook, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1973, Ser. No. 392,384

Int. Cl. G01d *5/02;* **G01n** *29/04*

U.S. Cl. 346—33 F **1 Claim**



1. A portable manually scanned flaw detecting and recording system for recording on a sheet of paper, in one-to-one correspondence; flaws in a structure below a determined area of the surface of the said structure being tested for flaw defects, the said system comprising:

a. a parallel motion mechanism having a fixed pivot and a movable pivot with a blade, moving in parallel relationship, having a first end and a second end attached at the said first end to the said movable pivot;

b. a suction cup attached at the said fixed pivot of the parallel motion mechanism to removably attach the said mechanism to the said surface of the said structure being tested;

c. a flaw sensor attached to the said movable pivot and positioned in detecting relationship to the said surface of the said structure, providing an electrical output indication of a flaw in the said structure;

d. a hand wheel attached to the said movable pivot for manually scanning the said sensor over the said determined area;

e. a writing pen;

f. means for positioning the said writing pen at the said second end of the said blade, the said positioning means including;

1. a retracting spring holding the tip of the said pen above the said paper,

2. a solenoid having a plunger attached to the said pen for moving the said pen against the force of the said retracting spring into writing engagement on the said paper when the said solenoid is energized,

3. a support rod positioning the writing tip of the said pen over and away from the said sheet of paper when the said solenoid is not energized,

4. means for manually engaging the said pen into writing relationship on the said paper; and

g. means cooperating with the output of the said flaw sensor and the said solenoid for energizing the said solenoid when the said sensor is passed over a flaw.

3,883,880

EXPOSURE APPARATUS FOR MANUFACTURING FLUORESCENT SCREENS OF COLOUR PICTURE TUBES

Eiichi Yamazaki, Ichihara; Koichi Maruyama; Toshio Ueda, both of Mobara, and Iwao Ogura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 12, 1973, Ser. No. 424,092

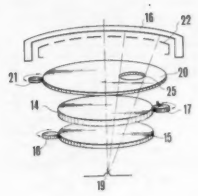
Claims priority, application Japan, Dec. 25, 1972, 47-129272

Int. Cl. G03b *27/00*

U.S. Cl. 354—1 **7 Claims**

1. In an exposure apparatus for manufacturing a fluorescent screen of a colour picture tube of the class wherein a correc-

tion lens is interposed between a source of light and an assembly of a shadow mask and panel on which said fluorescent screen will be developed, the improvement which comprises composite correction lens means including at least two correction lenses, a shield member positioned between said composite correction lens means and said assembly, said shield member provided with a perforation for exposing a selected area of said panel, and means for varying the relative angular position of said composite correction lens means and said shield member for moving said selected area over a selected portion on said panel corresponding to the correction provided by said lens means.

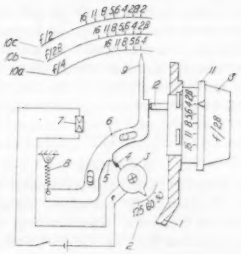


3,883,881

PHOTOGRAPHIC CAMERA HAVING AN INTERCHANGEABLE OBJECTIVE

Heinz Schulze, Dresden, Germany, assignor to Veb Pentacon Dresden, Dresden, Germany

Filed Oct. 2, 1972, Ser. No. 293,914
Int. Cl. G03b *7/06*
U.S. Cl. 354—46 **1 Claim**



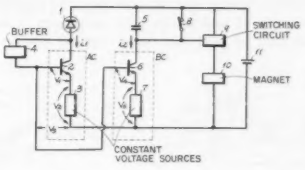
1. In a photographic camera assembly an interchangeable objective which has a housing, a non-preselectable diaphragm, diaphragm setting means within the housing for adjusting said diaphragm, a camera housing, an exposure meter arranged in the camera housing and including a photoelectric device positioned in the light path of the assembly camera, a moving coil, and a needle attached to said moving coil, settable indicating means movable within the housing and a return spring acting on said indicating means, whereby alignment of said needle with said indicating means indicates correct exposure, a fine control element affixed to said objective housing, said control element being immovable with respect to said diaphragm setting means for cooperation with said indicating means when said objective is fixed in said camera housing, to hold said indicating means against said return spring in a position corresponding to the widest aperture which can be set on said objective.

3,883,882

ELECTRIC SHUTTER CONTROL CIRCUIT FOR SINGLE LENS REFLEX CAMERAS

Chiharu Mori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1972, Ser. No. 296,038
Claims priority, application Japan, Oct. 14, 1971, 46-81143
Int. Cl. G03n *7/08*
U.S. Cl. 354—51 **9 Claims**



1. An electric shutter control circuit for a single lens reflex camera comprising:

a. first and second circuit sections, each comprising:

a transistor having an emitter-collector electrode circuit having first and second sides and a base electrode circuit,

a constant-voltage source having first and second sides, the first side being coupled to a first side of the emitter-collector electrode circuit of said transistor, wherein said constant voltage source comprises the serial connection of a variable resistor and means providing a logarithmic function output, and an operational amplifier responsive to said logarithmic function output for providing between said first and second sides said constant-voltage independent of current therethrough;

b. current controlling photosensitive means coupled to a first side of the emitter-collector electrode circuit of the transistor in the first circuit section for controlling the amount of current through such transistor corresponding to the intensity of received light;

c. a bias circuit responsive to the current from said photosensitive means for applying a corresponding bias current to the base electrodes of both said transistors in both said circuit sections;

d. a capacitor having first and second sides, the first side being coupled to the second side of the emitter-collector electrode circuit of the transistor in the second circuit section, enabling such transistor to provide a constant-current charge to the capacitor; and

e. means for providing a source of potential across the second sides of said photosensitive means and said constant-voltage source of said first circuit section and a source of potential across said second sides of said capacitor and constant-voltage source of said second circuit section;

f. the variable resistor in at least one of the circuit sections being arranged to provide an adjustable signal corresponding to photographic determining factors.

3,883,883

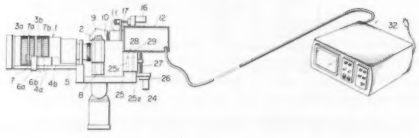
REMOTE CONTROL DEVICE FOR CAMERA

Yozo Sano, Fujiwasa-shi, Kanagawa-ken; Sadahiko Tsuji, Yokohama; Yukio Mashimo, Tokyo, and Masaharu Ito, Kawasaki-shi, Kanagawa-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Sept. 20, 1973, Ser. No. 399,192
Claims priority, application Japan, Sept. 22, 1972, 47-95300; Sept. 22, 1972, 47-110317
Int. Cl. H01j *29/89*
U.S. Cl. 47-110316 **5 Claims**

1. A remote control photographing system comprising, in combination, a photographic camera having a viewfinder optical system including a photographing lens providing an

image of a scene at a focusing plane; an image pick up device having an image pick up optical system including a distance adjusting means, for setting the distance of said image pick up optical system, and having an image pick up tube including a photosensitive plane for forming an image of a scene viewed by said image pick up optical system; displacement means operable to displace said image pick up device between a first position, in which the optical axis of said image pick up optical system is aligned with the optical axis of said viewfinder optical system for viewing of the image in the focusing plane of said viewfinder optical system, and a second position in which the optical axis of said image pick up system is out of alignment with that of said viewfinder optical system for direct



viewing of a scene by said image pick up optical system; locking means operable to releasably latch said distance adjusting means at the shortest distance setting in which the image in the focusing plane of said viewfinder optical system is focused on the photosensitive plane of said pick up tube with said image pick up device in said first position; release means operable to release said locking means responsive to displacement of said image pick up device to said second position by said displacement means; and a television monitor connected to said image pick up tube and operable to display the image formed on said photosensitive plane, said television monitor including selectively operable operative means controlling said distance adjusting means and said displacement means.

3,883,884

PHOTOGRAPHIC CAMERA HAVING AN ACCESSORIES MOUNTING SHOE

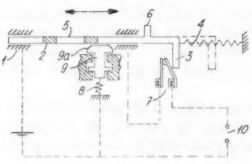
Harald Fuchsel, Dresden, Germany, assignor to Veb Pentacon Dresden, Dresden, Germany

Continuation-in-part of Ser. No. 359,969, May 14, 1973, abandoned. This application Mar. 21, 1974, Ser. No. 453,550

Claims priority, application Germany, Nov. 17, 1972, 166905; Jan. 15, 1973, 2301819

Int. Cl. G03b *15/03*

U.S. Cl. 354—126 **3 Claims**



1. In a photographic camera having a flashgun mounting shoe with a centre contact device disposed therein, a cable socket contact device located on the camera, a first circuit comprising a synchronous shutter switch and said centre contact device, a second circuit comprising said synchronous shutter switch and said cable socket contact device, the provision of

a. a further switch arranged in said second circuit,

b. an insulating slide located in said shoe and adapted to be operated by the flashgun and which co-operates both with the centre contact device and said further switch to open the latter when the flashgun is inserted and closed when the flashgun is not present.

3,883,885

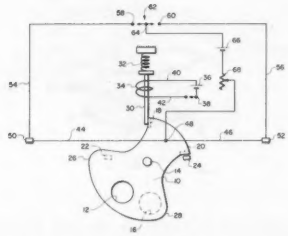
HIGH-SPEED SHUTTER

Carl Orlando, 47 Willow Rd., New Shrewsbury, N.J. 07724

Filed Dec. 4, 1973, Ser. No. 421,551

Int. Cl. G03b *9/10*

U.S. Cl. 354—258 **5 Claims**



1. In a camera, a shutter mechanism comprising a shutter mounted in the camera for movement between two positions, a length of wire secured at one end to the camera and mechanically linked to the shutter at the other end for moving the shutter from one of its positions to its other position, said wire being of the type which when stretched is quiescent at its stretched length and has a memory for its prestretched length and is characterized by a martensitic critical temperature, shutter cocking means linked to said shutter for moving the shutter from its other position to its one position and for stretching said wire, said shutter cocking means including a second length of wire of the same kind of material as the first-recited wire and secured at one end to the camera and at its other end mechanically linked to the shutter said lengths of wire being oriented in opposition, and a current pulse generator connected to the second length of wire for producing a transient temperature rise in the second length of wire with a peak at least as high as its martensitic critical temperature and of sufficient persistence to return the latter to its prestretched length and to move the shutter to its one position and to stretch the first-recited wire.

3,883,886

PHOTOGRAPHIC DIAPHRAGM AND CAMERA

Bodo Mielke, Wolfenbuttel, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Continuation-in-part of Ser. No. 335,914, Feb. 26, 1973, Pat. No. 3,812,501, which is a continuation-in-part of Ser. No. 155,415, June 22, 1971, Pat. No. 3,724,350. This application Apr. 2, 1974, Ser. No. 457,169

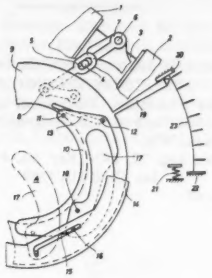
Claims priority, application Germany, Apr. 4, 1973, 2316812

Int. Cl. G03b *9/06*

U.S. Cl. 354—271 **7 Claims**

1. A photographic diaphragm comprising a series of diaphragm leaves **10** pivoted for swinging movement from maximum aperture position to minimum aperture position, there being a small central opening for passage of light when said leaves are in minimum aperture position, a pivoted closing element **17** separate from said diaphragm leaves for obstructing passage of light through said small central opening so that said diaphragm may be used to prevent entrance of all light through the lens of a camera on which said diaphragm is mounted while taking a reading of stray light entering the camera elsewhere, adjusting mechanism for adjusting the position of said diaphragm leaves **10**, said closing element **17** being coupled to said adjusting mechanism to be moved

thereby, a fixed ring, and a cam slot **15** in said fixed ring, said adjusting mechanism including a driving ring **9**, said closing



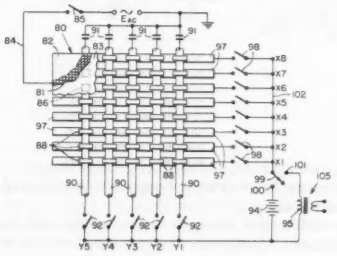
element **17** being pivotally mounted on said driving ring **9** and having a control pin **16** engaged in said cam slot **15**.

3,883,887

METAL OXIDE SWITCHING ELEMENTS

Thomas L. Robinson, Sr., East Aurora, N.Y., assignor to Astronics Corporation, East Aurora, N.Y.

Filed Feb. 9, 1973, Ser. No. 331,268
Int. Cl. H01l *11/00*
U.S. Cl. 357—2 **5 Claims**



1. An electrical switching circuit, comprising

an aluminum element having thereon an aluminum oxide film normally having a high resistance to current flow,

a plurality of spaced electrodes mounted at the side of said film opposite said aluminum element,

means for connecting said aluminum element and a selected one of said electrodes across a pulsating voltage supply, said film changing its resistance, when said pulsating voltage reaches a predetermined value above zero, from a high to a low value only in the area thereof which is in contact with said selected electrode, and

means for applying a reset voltage between said element and said selected electrode to switch said selected area of said film back from said low to said high value of resistance when said pulsating voltage falls below said predetermined value,

said selected area of said film remaining in its low resistance mode, regardless of the value of said pulsating voltage, until switched back to its high resistance mode by said reset voltage, and

said connecting means comprising an electrical conductor connected to said pulsating voltage supply and having one end confronting the oxide film on said element and positioned to register selectively with said electrodes, and

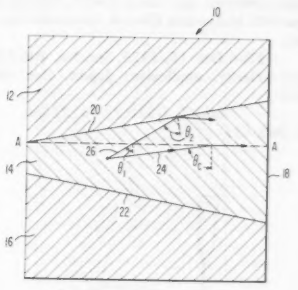
means for effecting relative movement between said element and said conductor selectively to cause said one end of said conductor to register with a selected electrode to apply the pulsating voltage thereacross.

3,883,888

EFFICIENCY LIGHT EMITTING DIODE

Henry Kressel, Elizabeth, N.J., and Harry Francis Lockwood, New York, N.Y., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 414,757
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 357—16 **5 Claims**



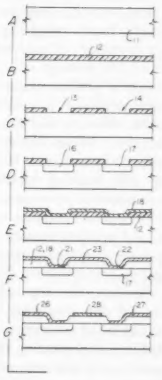
1. A semiconductor light emitting diode comprising a body of single crystalline material having a pair of spaced heterojunctions extending to an edge and said heterojunctions being divergent with respect to each other to said edge.

3,883,889

SILICON-OXYGEN-NITROGEN LAYERS FOR SEMICONDUCTOR DEVICES

John H. Hall, Saratoga, Calif., assignor to Micro Power Systems, Inc., Santa Clara, Calif.

Filed Apr. 15, 1974, Ser. No. 460,736
Int. Cl. H01l *5/00, 3/00*
U.S. Cl. 357—73 **5 Claims**



1. In a semiconductor device of the type which includes a substrate of semiconductor material of one conductivity type and a region of opposite conductivity type extending therein and to form a junction therewith which extends to one surface of the device, a protective layer carried on said one surface of the device and extending over said junction to passivate and protect the junction, said layer comprising a composition of silicon, oxygen and nitrogen ($Si_x O_y N_z$) in which

$x = 30\%$ to 40%

$y = 45\%$ to 55%
$z = 10\%$ to 20%

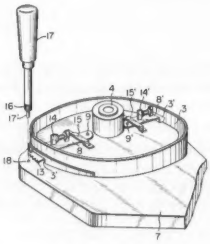
where z, y and z are the atomic percentages for silicon, oxygen and nitrogen respectively.

3,883,890

DEVICE FOR DETECTING THE ROTATING PHASE OF ROTARY MAGNETIC HEADS OF VIDEO TAPE RECORDING APPARATUS

Shizuhiko Tanigawa, and Shozo Kanda, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 15, 1973, Ser. No. 406,537
Claims priority, application Japan, Oct. 20, 1972, 47-121616[U]
Int. Cl. G11b *27/36, 21/04*
U.S. Cl. 360—31 **4 Claims**



1. A device for detecting the rotating phase of a rotary magnetic head of a video tape recording apparatus comprising

a. a base;

b. a stationary cylindrical drum mounted upon said base;

c. a rotating member mounted above said stationary drum for rotation about the axis thereof, the walls of said rotating member being defined by a round cylindrical surface;

d. a plurality of magnetic heads provided with tips and mounted upon said rotating member, the tips of said plurality of magnetic heads extending radially outwardly beyond the outer periphery of said rotating member;

e. means for detecting the passage of said plurality of magnetic heads through a predetermined position, said detecting means comprising a plurality of first detecting elements positioned beneath said rotating member, each first detecting element being aligned with each of said plurality of magnetic heads and within the cylindrical surface defining said rotating member, and a second detecting element mounted upon an upper surface of said stationary drum in opposed relation with the path of said first element on said rotating member;

f. means for angularly displacing said second detecting element upon said stationary drum along said path of said first detecting element, thereby adjusting the mutual angular positions of the detecting elements from the exterior of the rotary head assembly while said video tape recording apparatus is transporting the video tape; and

g. said means for positioning said second detecting elements upon said stationary drum comprising a plurality of mounts equal in number to said second detecting elements; one end of each of said plurality of mounts being equiangularly pivoted on said stationary drum symmetrically with respect to the axis of said rotating member and as close to the axis of said rotating member as practicable so that they are movable substantially about the axis of said rotating member; and

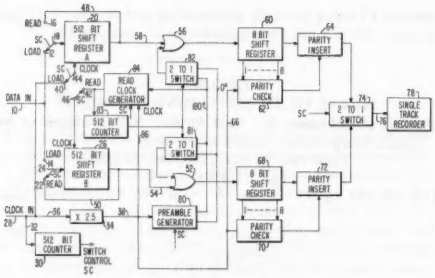
wherein the side wall of said stationary drum is provided with slits, the other end of each of said plurality of mounts extending radially beyond the outer periphery of said stationary drum through said slits formed through the side wall thereof.

3,883,891

REDUNDANT SIGNAL PROCESSING ERROR REDUCTION TECHNIQUE

Charles Robert Thompson, Blackwood, and Robert Jones Flint, Somerdale, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 22, 1974, Ser. No. 499,603
Int. Cl. G11b *5/09*
U.S. Cl. 360—47 **10 Claims**



1. In combination:

first means adapted for connection to a source of information signals;

first and second channels connected to said first means, each of said channels having a signal storage means;

second means for loading a first block of said information signals into said first channel signal storage means at a first clock rate;

third means for reading out said first block of information signals from said first channel signal storage means and for re-loading said first block of signals into said first channel signal storage means and for subsequently reading out said re-loaded first block of signals from said first channel signal storage means at a second clock rate higher than said first clock rate;

fourth means for loading a second block of said information signals into said second channel signal storage means at said first clock rate during the time interval corresponding to the operation of said third means;

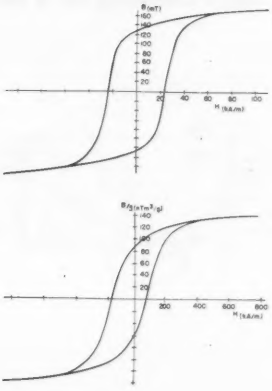
fifth means for reading out said second block of information signals from said second channel signal storage means and for re-loading said second block of information signals into said second channel signal storage means and for subsequently reading out said re-loaded second block of information signals from said second channel signal storage means at said second clock rate at times corresponding to the loading of said first channel signal storage means at said first clock rate; and

switch means connected to said first and second channels operable for providing at a given terminal, in a serial stream of signals, first and second representations of said first block of information signals from said first channel and first and second representations of said second block of information signals from said second channel.

3,883,892
METHOD OF MAKING MAGNETIC RECORDINGS WHICH CANNOT BE ALTERED WITHOUT IT BEING NOTICED

Eckart Kneller, Bochum; Eberhard Koester, Frankenthal; Gerd Wunsch, Speyer; Paul Deigner, and Dieter Graw, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 16, 1973, Ser. No. 406,972
Claims priority, application Austria, Oct. 20, 1972, 8986/72
Int. Cl. G01d *15/12*; G11b *23/28*
U.S. Cl. 360—59 **9 Claims**



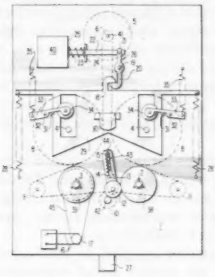
1. A method of making magnetic recordings on magnetic recording media which cannot be altered without it being noticed, wherein on a magnetic recording medium containing exchange-anisotropic magnetizable material, which material consists of a ferri- or ferromagnetic component to which there is coupled an antiferromagnetic component in respect of which, below a given temperature T_S lower than the Neel temperature T_N of the antiferromagnetic component, the critical magnetic field required to bring about the irreversible rotation of the antiferromagnetic axis and, in addition, the magnetic field needed for the production of any magnetizing structure leading to the irreversible rotation of the antiferromagnetic axis are stronger than the strongest magnetic field H_{zm} that can be produced with the technical means used in the magnetic recording of signals, so that all magnetization structures capable of being produced in magnetic fields smaller than, or equal to, H_{zm} vanish again partly or completely after the magnetic field has been turned off, such that the signals previously fixed at a temperature above T_S will either be completely or partly regenerated automatically or can be restored

a. the signals are recorded at a temperature above or below the temperature T_S and the magnetic recording medium, after the recording has been made, is heated to a temperature above this temperature T_S and at least to a temperature T_{AFS};
b. the magnetic recording medium is then cooled to a temperature below the temperature T_S, and
c. is subsequently provided with an indicator irreversibly indicating the fact that the magnetic recording medium has been reheated to a temperature equal to or above T_S, and
d. the recording is then marked at both ends by physical or chemical means.

3,883,893
MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

Yoshiharu Ueki; Yoshio Maruyama; Yoshihiro Magata; Akihiro Fushimi, and Katsuhisa Shimizu, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 11, 1974, Ser. No. 450,260
Claims priority, application Japan, Mar. 9, 1973, 48-27805
Int. Cl. G11b *15/18*, *15/44*, *23/04*
U.S. Cl. 360—74 **5 Claims**



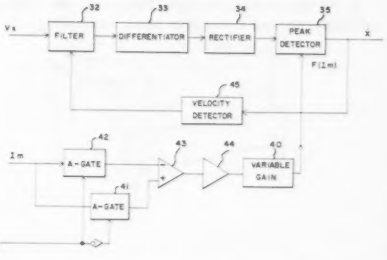
1. In a casette tape recording and reproducing device of the type having rotatable supply and take-up spindles to engage the supply and take-up reels in the casette, at least one capstan tape driving means, at least one pinch roller selectably engageable with said capstan, a motor driven means to rotate said at least one capstan, and a moveable carriage to bring said pinch rollers into contact with said capstan and the transducer head into contact with the tape, the improvements comprising:

a. means to rotate said supply spindle in a rewind direction, by running the motor in the reverse direction,
b. means for sensing rotation of the take-up spindle in the rewind direction,
c. means responsive to said sensing means to change the direction of the motor to the forward direction, and to move the carriage so as to engage the transducer head with the tape and bring said at least one pinch roller into contact with said at least one capstan to provide a driving movement to the tape.

3,883,894
DISK DRIVE SERVO SYSTEM

Terry G. Johnson, San Jose, Calif., assignor to Storage Disk Corporation, Louisville, Colo.

Filed Oct. 19, 1973, Ser. No. 407,884
Int. Cl. G11b *21/08*, *19/14*
U.S. Cl. 360—78 **4 Claims**



1. An electronic tachometer for a magnetic disk subsystem of the type including:

magnetic disks which are mounted for common rotation;

an access mechanism carrying magnetic heads into read-

write relationship with the tracks of said magnetic disks;

a motor for driving said access mechanism;

a servo disk mounted for concurrent rotation with said other disks, said servo disk having recorded thereon a magnetic pattern which produces from a head in reading relationship therewith an oscillating position signal representing the position of said access mechanism with respect to the tracks of said disks during a seek for a particular track;

a variable bandwidth filter for receiving and filtering said position signal;

differentiating means coupled to said variable bandwidth filter to receive a filtered signal therefrom and to produce a velocity signal which represents the velocity of said access mechanism across the tracks of said magnetic disks except during those intervals when said oscillating position signal undergoes a reversal in amplitude change;

means for generating a current signal representing the current supplied to said motor driving said access mechanism;

integrating means for integrating said motor current signal;

combining means for combining the differentiated position signal and the integrated current signal to produce an output signal representing access mechanism velocity with respect to said tracks;

a velocity detector coupled to said combining means for producing an output signal representing the velocity being applied to said velocity detector, the output of said velocity detector being applied to said variable bandwidth filter to change the bandwidth of said filter so that said filter has a broad bandwidth for high velocity signals and a lower band width for low velocity signals;

said motor current signal having a polarity in the reverse direction which is the opposite of its polarity when said rotary access mechanism is being driven in the forward direction, said integrated motor current signal being applied to add to the voltage on said combining means during the acceleration portion of a seek and being applied to subtract from said voltage during a deceleration portion of a seek; and

a variable gain circuit, said motor current signal being applied through said variable gain circuit to said combining means, said variable gain circit including means for switching the gain of said motor current signal between a gain less than one and a gain greater than one during the accelerate and decelerate portions of each seek.

3,883,895

CARTRIDGE CHANGER

Youichi Kawaharasaki, Yokohama, Japan, assignor to Victor Company of Japan, Limited

Filed June 13, 1973, Ser. No. 369,569

Claims priority, application Japan, June 14, 1972, 47-70196[U]

Int. Cl. G11b *15/68, 25/06*

U.S. Cl. 360—92 **6 Claims**

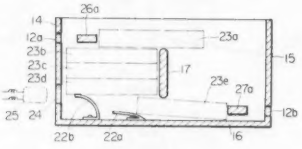
1. An automatic cartridge changer for use with a plurality of cartridges and a magnetic head, comprising:

a housing having a first wall which defines a pair of parallel, horizontal slots, the housing having a second wall which has an aperture for said magnetic head defining a cartridge playing and recording position in the housing;

cartridge guide means in said housing forming first and second compartments therein, said second compartment receiving a stack of cartridges, and said first compartment receiving a separate cartridge;

spring means in said second compartment for upwardly biasing the stack of cartridges to vertically align one of the stacked cartridges with said cartridge playing and recording position;

a pair of parallel horizontal gear racks vertically spaced apart and disposed along said first wall, each being horizontally moveable in opposite directions and each having, at one end of the rack, a lug projecting through and slidable along a corresponding one of said slots, said



guide means defining upper and lower apertures between said first compartment and said second compartment for enabling the lug of one rack to push a separate cartridge from the second compartment into a lowermost position in the first compartment between said spring means and the stack to become a stacked cartridge, and for enabling the lug of the other rack to simultaneously push an uppermost stacked cartridge from the first compartment into the second compartment to enable it to fall therein and to become said separate cartridge; and

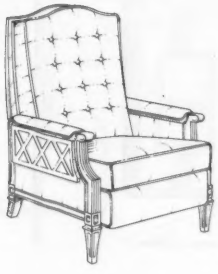
a pinion located between and meshing with both gear racks for simultaneously moving them in mutually opposite directions to move their respective lugs and thereby to move said separate cartridge and an uppermost stacked cartridge in and from said second and first compartments respectively to said first and second compartments, to thereby change the alignment of stacked cartridges with said cartridge playing and recording position.

DESIGNS

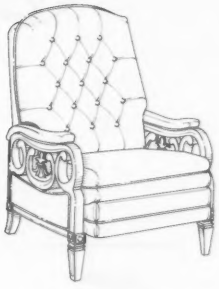
MAY 13, 1975

235,084
TABLE
Lynn H. Kephart, Arlington, Tex.
(R.R. 1, Box 383, Marathon, Fla. 33050)
Filed Mar. 8, 1973, Ser. No. 339,264
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

235,085
CHAIR
Thomas Winrow, Naperville, Ill., assignor to Mohasco Corporation, Amsterdam, N.Y.
Filed Aug. 8, 1973, Ser. No. 386,810
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68

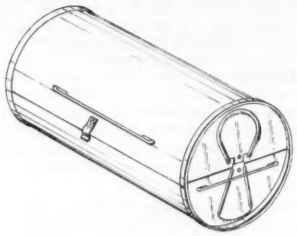


235,086
CHAIR
George Mergenov, Closter, N.J., assignor to Mohasco Corporation, Amsterdam, N.Y.
Filed Aug. 23, 1973, Ser. No. 391,162
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68

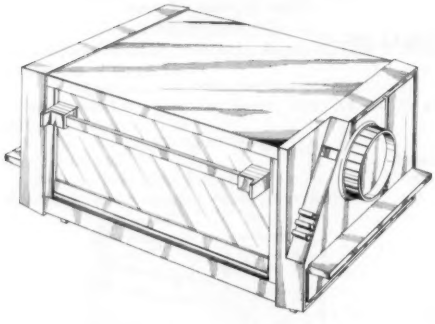


235,087
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Mohasco Corporation, Amsterdam, N.Y.
Filed July 23, 1973, Ser. No. 382,090
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

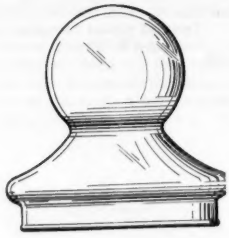
235,088
PORTABLE BARBECUE
Frederick J. Erickson, 3910 51st St., Des Moines, Iowa 50130
Filed Aug. 30, 1973, Ser. No. 392,865
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110



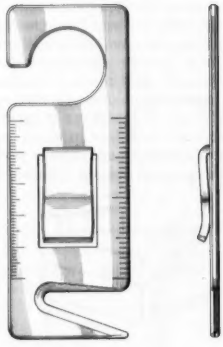
235,089
BROILER
George T. Lloveras, New York, N.Y., assignor to Cornwall Corporation, Boston, Mass.
Filed Oct. 1, 1973, Ser. No. 402,149
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—126



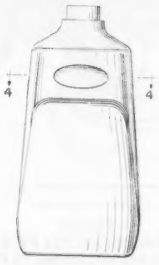
235,090
CANISTER LID OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 24, 1973, Ser. No. 409,080
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—131



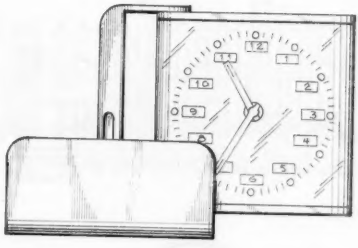
235,091
COMBINED LETTER OPENER AND MEASURING INSTRUMENT
Robert H. C. M. Daenen, Erembodegem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 10, 1973, Ser. No. 387,307
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—104



235,092
BOTTLE
Donald J. Leary, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 13, 1973, Ser. No. 388,051
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149



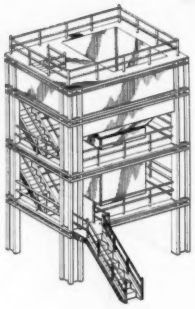
235,093
COMBINED TRAVEL CLOCK AND CASE
Klaus Kroner, Magstadt, Wurttemberg-Baden, Germany, assignor to Blessing-Werke KG., Waldkirch im Breisgau, Germany
Filed Aug. 24, 1972, Ser. No. 283,509
Claims priority, application Germany Feb. 25, 1972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—18



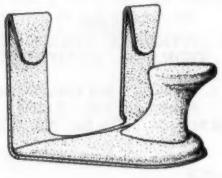
235,094
MARINE LIFESAVER RADIO BEACON
Joseph William Murphy, 10568 Holman Ave., Los Angeles, Calif. 90024; Wayne Anderson Taylor, 1340 W. Compton Blvd., Gardena, Calif. 90247; and Thomas Aloysius Aspell, Jr., 25913 Viana Ave., Lomita, Calif. 90717
Filed June 29, 1973, Ser. No. 374,820
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D10—109

235,095
COMBINED ENTRANCE STAIRCASE AND ENCLOSED STORAGE COMPARTMENT FOR MOBILE HOMES
Francis L. Struben, 8303 Philadelphia Road, Baltimore, Md. 21206
Filed May 30, 1973, Ser. No. 365,364
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—7 R

235,096
ASPHALT PLANT TOWER OR SIMILAR ARTICLE
Frederick A. Mohr, Signal Mountain, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.
Filed Dec. 17, 1973, Ser. No. 425,337
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R



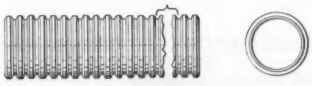
235,097
SADDLE HORN LASSOING TRAINER
Wilburn Ashley Davis, P.O. Box 6752, Lubbock, Tex. 79413
Filed Aug. 3, 1973, Ser. No. 385,460
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



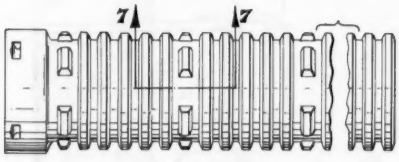
235,098
FAUCET HANDLE
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Aug. 20, 1973, Ser. No. 389,562
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29

235,099
SPOUT
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Aug. 20, 1973, Ser. No. 389,805
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32

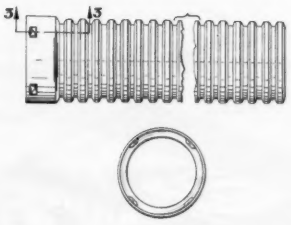
235,100
CORRUGATED PIPE
Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc.
Filed Dec. 5, 1973, Ser. No. 421,859
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—45



235,101
CORRUGATED PIPE
Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc.
Filed Dec. 5, 1973, Ser. No. 422,020
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—45

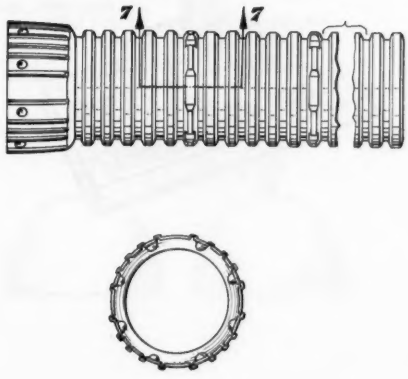


235,102
CORRUGATED PIPE
Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc.
Filed Dec. 5, 1973, Ser. No. 422,021
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—45

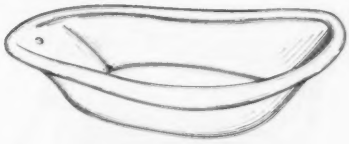


235,103
CORRUGATED PIPE
Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc.
Filed Dec. 5, 1973, Ser. No. 422,022
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—45

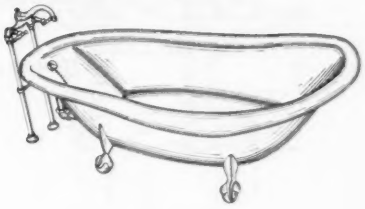
235,104
CORRUGATED PIPE
Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc.
Filed Dec. 5, 1973, Ser. No. 422,023
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—45



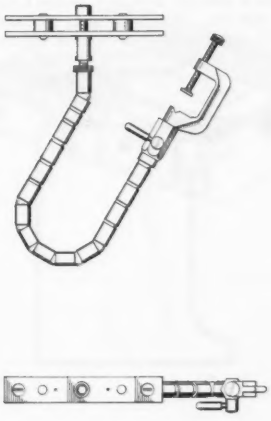
235,105
BATH TUB
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Aug. 20, 1973, Ser. No. 389,561
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



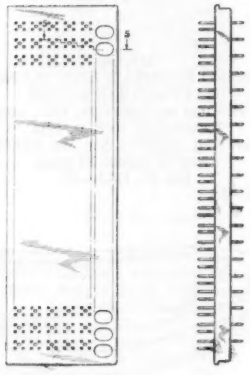
235,106
COMBINED BATHTUB AND PLUMBING FIXTURES THEREFOR
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Aug. 20, 1973, Ser. No. 389,582
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—56



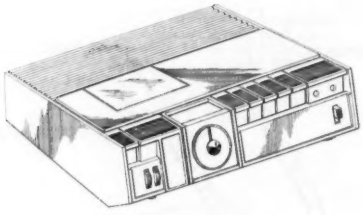
235,107
FLEXIBLE SUPPORT FOR DENTAL AND SURGICAL INSTRUMENTS
David T. Adler, Plainview, N.Y.
(5 Lenox Ave., Farmingdale, N.Y. 11735)
Filed Apr. 5, 1973, Ser. No. 348,184
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1 B



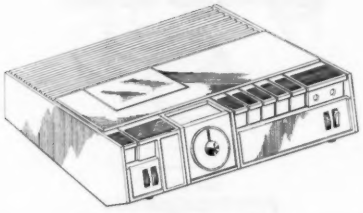
235,108
UNIVERSAL CONNECTOR BLOCK FOR TELEPHONE FRAME EQUIPMENT
Paul V. De Luca, Port Washington, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed June 12, 1972, Ser. No. 262,139
Term of patent 14 years
Int. Cl. D14—*08*
U.S. Cl. D26—14 R



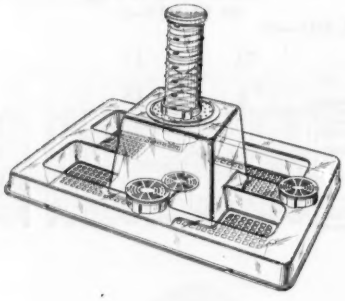
235,109
DICTATION RECORDING AND PLAYBACK APPARATUS OR SIMILAR ARTICLE
David K. Walz, Atlanta, Ga., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.
Filed Jan. 9, 1974, Ser. No. 432,055
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



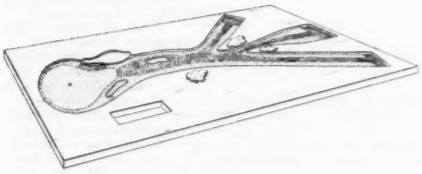
235,110
TRANSCRIPTION PLAYBACK APPARATUS OR SIMILAR ARTICLE
David K. Walz, Atlanta, Ga., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.
Filed Jan. 9, 1974, Ser. No. 432,057
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



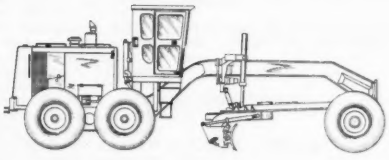
235,111
SMALL ANIMAL PLAYGROUND
David D. Lovitz, Short Hills, N.J., and Ness Eastman, Rego Park, and William H. Davidson, Katonah, N.Y., assignors to The Hartz Mountain Corporation, Harrison, N.J.
Filed Nov. 19, 1973, Ser. No. 416,925
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



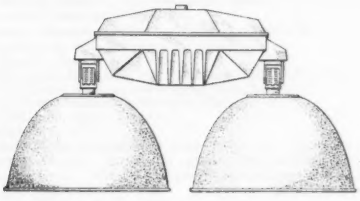
235,112
GOLF GAME BOARD
James T. Reese, 5350 Meadowlark Drive NW., North Canton, Ohio 44720
Filed Oct. 24, 1973, Ser. No. 409,061
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GL



235,113
MOTOR GRADER VEHICLE
Vergil P. Hendrickson, Harold M. Johnson, Virgil H. Johnson, and Paul C. Rosenberger, Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 30, 1973, Ser. No. 355,543
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5

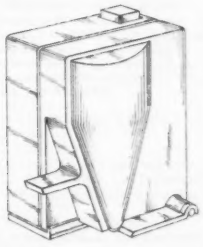


235,114
TWIN LAMP LUMINAIRE
Frank V. Steenhoven, Hudson, and Jerry L. Hurley, Ravenna, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 14, 1974, Ser. No. 442,971
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



235,115
TYPEWRITER
Manfred Link, Nuremberg, Germany, assignor to Triumph Werke Nurnberg A.G., Nuremberg, Germany
Filed Oct. 16, 1973, Ser. No. 406,948
Claims priority, application Germany July 2, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

235,116
HAND HELD PRINTER
Myron F. Davis, Jr., Boca Raton, Fla., and Walter Furlani, Poughkeepsie, N.Y., assignors to International Business Machines, Inc., Armonk, N.Y.
Filed July 26, 1974, Ser. No. 492,320
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R



235,117
UMBRELLA HANDLE
Peter Stamm, Witzhelden, Germany, assignor to Telesco Brophey, Limited, Montreal, Quebec, Canada
Filed July 13, 1973, Ser. No. 378,948
Claims priority, application Germany Jan. 30, 1973
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3 A

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF MAY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Swanson, John L., 3,883,132.
A. E. Staley Manufacturing Co.: *See—*
Peos, Charles E., 3,883,455.
A. Kettenbach, Firma: *See—*
Jahn, Ulrich W. K., 3,882,601.
Abex Corporation: *See—*
Viles, Alan H; and Smith, Gary C., Jr., 3,882,891.
Abos, Ralph L., to Dynapunch Systems, Inc. Power stylus. 3,883,055, Cl. 225-103.000.
Abrahamson, Gerald R.: *See—*
Mereness, Charles E.; and Abrahamson, Gerald R., 3,882,581.
Abramitis, Walter William; and Callahan, John J., to Akzona Incorporated. Plant growth regulators. 3,883,342, Cl. 71-76.000.
Abrukin, Abram Lvovich. Apparatus for checking the continuity of metallic pipes using an oscillator whose frequency changes at discontinuities. 3,883,797, Cl. 324-37.000.
Accurso, Serafino. Electrically Rocked Crib. 3,882,556, Cl. 5-109.000.
ACF Chemiefarma N.V.: *See—*
Akkerman, Antony Marie; and Janssen, Paul Adriaan Jan, 3,883,536.
ACF Industries, Incorporated: *See—*
Jourdan, Jerry W., 3,883,111.
Kolb, John P., 3,883,113.
Achenbach, Dieter; Joswig, Siegfried Adolf; and Kolb, Walter, to Wolf-Gerate GmbH. Power pack. 3,883,789, Cl. 320-2.000.
Ackley, Richard H., to PPG Industries, Inc. Method and apparatus for forming a uniform glass fiber continuous mat. 3,883,333, Cl. 65-2.000.
Acme-Cleveland Corporation: *See—*
Holt, Frederick R.; and Flueckiger, Noah, 3,883,796.
Acoveno, Floyd A.; and Freudiger, Thomas W., to R.S.R. Corporation. Process for the removal of sulfur from battery wrecker material using ammonium carbonate solution. 3,883,348, Cl. 75-103.000.
Acquaviva, Gwendolyn Kay. Grooming aid for hairy animals. 3,882,824, Cl. 119-156.000.
Adamian, Andrew A.; Long, David K.; and Pezzolo, Donald E., to Fairchild Camera and Instrument Corporation. Automotive ignition control. 3,882,840, Cl. 123-148.00E.
Adams, Lawrence R., to Bio/Physics Systems, Inc. Method for fluorescence analysis of white blood cells. 3,883,247, Cl. 356-39.000.
Advertising Metal Display Co.: *See—*
Slaga, Case J., 3,883,004.
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Croix, Louise S., 3,883,664.
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Shrader, Robert L.; and Tsujimoto, Kazumi N., 3,883,679.
Aisin Seiki Kabushiki Kaisha: *See—*
Inada, Masami; and Kondo, Toshiyuki, 3,883,185.
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Yamanaka, Shigeru; and Mitsugi, Koji, 3,882,635.
Akademie der Wissenischaften der DDR: *See—*
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Akitsuki, Ikuo: *See—*
Itoh, Takuji; and Akitsuki, Ikuo, 3,883,419.
Akkerman, Antony Marie; and Janssen, Paul Adriaan Jan, to ACF Chemiefarma N.V. 3,3-Disubstituted-2-benzyl-4-piperidinols. 3,883,536, Cl. 260-293.830.
Akopyan, Vladimir Surenovich: *See—*
Mosyakov, Evgeny Alexandrovich; Rtischev, Jury Vasilievich; Berer, Efim Zakharovich; Leus, Vladimir Markovich; Lukeev, Viktor Petrovich; Rodionov, Evgeny Markovich; Levitsky, Vladimir Lvovich; Akopyan, Vladimir Surenovich; Mindlin, Jury Yakovlevich; Balashov, Evgeny Ivanovich; Kinkulkin, Isaak Efimovich; Shumakova, Galina Petrovna; Fedotov, Evgeny Tikhonovich; and Lazarev, Vladimir Fedorovich, 3,883,873.
Aktiengesellschaft "Weser": *See—*
Janssen, Hans-Georg, 3,882,813.
Aktieselskapet Borregaard: *See—*
Dahl, Birger; and Hannestad, Arne Ludvig, 3,883,081.
Akzona Incorporated: *See—*
Abramitis, Walter William; and Callahan, John J., 3,883,342.
Aladdin Industries, Incorporated: *See—*
Wyatt, William B., 3,883,029.
Albaladejo, Pierre. Studded or spiked sports shoes. 3,882,614, Cl. 36-67.00D.
Alberkrack, Jade H., to Motorola, Inc. Tuning control system. 3,883,807, Cl. 325-420.000.
Alberny, Robert; and Delassus, Jean, to Institut de Recherches de la Siderurgie Francaise (IRSID); and Compagnie Electro-Mecanique (CEM). Apparatus for magnetic stirring of continuous castings. 3,882,923, Cl. 164-250.000.
Albright, Henry J.: *See—*
Wittern, Francis A.; Albright, Henry J.; and Wirstlin, Arthur N., 3,883,039.
Aling, Willem, to U.S. Philips Corporation. Gas discharge display system with current suppression means. 3,883,775, Cl. 315-84.600.
Allen-Harper, Inc.: *See—*
Allen, Kenneth M.; and Harper, Chester H., 3,882,889.
Allen, Kenneth M.; and Harper, Chester H., to Allen-Harper, Inc. Flow controlling system. 3,882,889, Cl. 137-454.200.
Allied Chemical Corporation: *See—*
Telmet, Juhan; and Stouffer, Richard C., 3,883,843.
Allis-Chalmers Corporation: *See—*
Cole, David R., 3,883,709.
Allison, Joseph M.: *See—*
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Bailey, Stanley M. Garment finishing apparatus. 3,883,051, Cl. 223-51.000.

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Ballu, Vincent Pierre Marie, to Tecnoma. Oscillating spraying apparatus. 3,883,073, Cl. 239-77.000.

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Barnett, Eugene J., to Westinghouse Electric Corporation. Self-cleaning wall oven with air flow system. 3,882,843, Cl. 126-273.00A.

Barney, Charles Azel, to Ark-Les Switch Corporation. Multiple push-button slide switch assembly with laminated slide actuator means for rod contacts. 3,883,704, Cl. 200-5.0EB.

Barrett, William J.; and Meyer, Hal G., to Barber-Colman Company. Positioning device. 3,883,839, Cl. 338-116.000.

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Barth, Wayne E., to Pfizer Inc. Method of preventing asthmatic symptoms. 3,883,653, Cl. 424-251.000.

Bartolat, Albert F. Stand for machine tool gauge. 3,883,103, Cl. 248-124.000.

Barton, James C.; Mueller, James P.; and Carter, John W., to Caterpillar Tractor Company. Vehicular seat mounting linkage. 3,883,172, Cl. 296-65.000.

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Bauer, Andreas, to Volkswagenwerk Aktiengesellschaft. Crush resistant compartment for vehicles. 3,883,171, Cl. 296-28.00R.

Bauer, Benjamin B.; Gravereaux, Daniel W.; and Torick, Emil L., to CBS Inc. System for reproducing four channel signals recorded on a disc record. 3,883,700, Cl. 179-100.4ST.

Bauerfeind, Klaus, to Motoren-und Turbinen-Union Munchen GmbH. System arrangement for governing gas turbine engines, especially gas turbine aero-engines. 3,882,672, Cl. 60-39.28R.

Baughman, Kenneth H., to General Electric Company. Centering and anchoring device. 3,883,206, Cl. 312-351.000.

Baumgarte, Ulrich; Weigold, Siegfried; and Scheuermann, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Dyeing and printing textiles with vat dyes using reductones and/or reductonates. 3,883,299, Cl. 8-34.000.

Baxter, Leonard N., to Stanadyne, Inc. Fuel pump. 3,883,270, Cl. 417-214.000.

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Berezin, Gilbert H.; and Boswell, George Albert, Jr., to du Pont de Nemours, E. I., and Company. 10-Nitro-5h-dibenzo(a,d)cycloheptene-5-ones and selected derivatives. 3,883,593, Cl. 260-590.000.

Berg, Sture; and Fors, Torsten, to Dynapac Maskin AB. Screeding beam for concrete. 3,883,259, Cl. 404-120.000.

Bergeron, Charles R.; and Baker, Ralph W., to Ethyl Corporation. Preparation of beryllium hydride. 3,883,645, Cl. 423-645.000.

Bergeron, Josef F., to Jet Lube, Inc. Grease composition. 3,883,439, Cl. 252-37.200.

Bergner, Isidore. Shuttle fur. 3,882,904, Cl. 139-213.000.

Bergwerksverband GmbH: *See—*
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Bernard, Richard A.; and Bernard, Arthur A., to Dover Corporation. Filter, particularly for smoke solids filtration. 3,883,331, Cl. 55-381.000.

Bernhoft, Gerald W., to Koehring Company. Control means for a pair of fluid motors. 3,883,023, Cl. 214-762.000.

Berry, Norman H. Ignition circuit radiation suppression structure. 3,883,776, Cl. 315-85.000.

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Best Lock Corporation: *See—*
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Betts, Max William; and Robinson, Frank. Knitting of garments. 3,882,697, Cl. 66-176.000.

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Courier de Mere, Henri Edouard Francois Marie, 3,883,246.

Billig, Frederick S.; Pirkle, James C., Jr.; and Grenleski, Stephen E., Jr., to United States of America, Navy. High reactivity fuels for supersonic combustion ramjets. 3,883,376, Cl. 149-22.000.

Billot, Jean, to Rafaut & Cie. Device for picking up and ejecting loads under an airplane. 3,883,097, Cl. 244-137.00R.

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Black, Robert B. Air-abrasive prophylaxis equipment. 3,882,638, Cl. 51-12.000.

Blake, William Wayne, to Caterpillar Tractor Company. Transmission control system with dual purpose modulating. 3,882,980, Cl. 192-3.570.

Blanc, Jean Henri: *See—*
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Blanco, Jose Antonio: *See—*
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Bloom, Stanley M.; and Garcia, Paulina P., to Polaroid Corporation. Intermediates for dipyrrylmethene dyes. 3,883,555, Cl. 260-326.50J.

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Bocca, Pier Luigi; and Pacor, Pierpaolo, to Exxon Research and Engineering Company. Method for making sulfur dioxide-treated asphalt binders. 3,883,404, Cl. 208-44.000.

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Bogert, Ernest H.; and Kotos, Peter, to General Electric Company. High-current current-limiting fuse. 3,883,838, Cl. 337-295.000.

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Bolle, Daniel, to Etablissement Manitra. Incinerator for domestic and industrial solid, semi-liquid or liquid waste. 3,882,801, Cl. 110-14.000.

Bombardier Limited: *See—*
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Southiere, Bertrand, 3,882,948.

Bommer, Paul. Method and apparatus for recording the number of phenomena. 3,883,878, Cl. 346-1.000.

Bone, David P.; and Shannon, Edward L., to Quaker Oats Company, The. Method of making a dry type pet food having a meat-like texture and composition thereof. 3,883,672, Cl. 426-311.000.

Bookout, Floyd V., to Rock-Ola Manufacturing Corporation. Can and bottle vendor. 3,883,038, Cl. 221-67.000.

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Boone, Joseph E.; and Schonegg, Louis E. Radio. 3,883,808, Cl. 325-335.000.

Booth, David L.: *See—*
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Bossert, Friedrich: *See—*
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Bowe Bohler & Weber Maschinenfabrik: *See—*
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Brassat, Bert, to Bayer Aktiengesellschaft. Process for the production of polyamide mouldings. 3,883,469, Cl. 260-37.00N.

Braun, Erich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Safety installation for two circuit brake systems of motor vehicles. 3,883,189, Cl. 303-84.00R.

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Brightman, Barrie; Datsko, George; Moll, Edward W.; and Stewart, William H., to Stromberg-Carlson Corporation. Control system for a digital switching network. 3,883,855, Cl. 340-172.500.

Brindell, Gordon D.; and Macander, Rudy F., to Quaker Oats Company, The. 4,4-Methylenebis (2,6-diaralkylphenols. 3,883,601, Cl. 260-613.00R.

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Brouwer, Charles William; and Cowan, Larry Clyde, to Leesona Corporation. Fluid operable binary control system with diagnostic indicators. 3,882,893, Cl. 137-557.000.

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Bucalo, Louis, to Investors In Ventures, Inc. Methods and devices for reducing lumen constriction. 3,882,845, Cl. 128-1.00R.

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Buccino, Jerry M. Spring clamp tool for servicing shock absorbers. 3,883,116, Cl. 254-10.500.

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Buchler, Joseph; Gross, Otto; and Parker, Bernard, to Buchler Instruments Division Nuclear-Chicago. Micropipetter, especially for the discharge of a sample and a diluent. 3,883,044, Cl. 222-309.000.

Budzich, Tadeusz. Load responsive control valve. 3,882,896, Cl. 137-596.100.

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Cagle, Albert W.; Greer, Wayne E.; and Weight, Wilbur J., to Western Electric Co., Inc. Circuit assembly. 3,883,682, Cl. 174-68.500.

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Carli, Othmar. Dimensionally and angularly adjustable template device for interior corner cutting of picture frame mats. 3,882,747, Cl. 83-561.000.

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Chiganov, Vyacheslav Anatolievich: *See*—
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Chiku, Takewo; Kogiso, Takeshi; Kojima, Kimie; and Yoshida, Takashi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Sodium-sulfur storage battery. 3,883,367, Cl. 136-6.00F.

Chinn, Leland J., to G. D. Searle & Co. 2-Ethynyl-2-hydroxy-5-(6-methoxy-2-naphthyl)-alpha, alpha-dimethylcyclopentaneethanol and esters. 3,883,582, Cl. 260-488.0CD.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Kanai, Toshio; Noguchi, Masaaki; Yanagioka, Hiroshi; Kogawa, Yosio; and Kondo, Susumu, 3,883,311.

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Chorey, Andro J. Batting tee apparatus. 3,883,138, Cl. 273-26.00R.

Christensen, Sheldon L. Suspension system for overland vehicles sleeping beds. 3,882,558, Cl. 5-118.000.

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Anderson, Grant L.; and Hish, Wilbur W., 3,882,803.

Cleary, William B., to Kinderman, Abraham S. Apparatus for wrapping and cutting material of indeterminate length. 3,882,658, Cl. 53-116.000.

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Clemens, John Ewart; Johnstone, Ben B.; and Strohmeyer, Heinz E., to United States of America, Army. Blast proof mines. 3,882,776, Cl. 102-8.000.

Cliff, Rodger A., to United States of America, General Counsel-Code GP. Digital phase-locked loop. 3,883,817, Cl. 331-1.00A.

Close, Albert R., to American Safety Equipment Corporation. Safety belt device. 3,883,089, Cl. 242-107.400.

Cloutier, Eugene F.; and Connolly, Douglas P., to Xerox Corporation. Oil applicator for reproduction machine fuser. 3,883,291, Cl. 432-60.000.

Coast, John B.: *See—*
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Cohen, Abraham B.; and Tobias, Herbert A., to du Pont de Nemours, E. I., and Company. Process and apparatus for delaminating an adherent receptor sheet on a sensitized element. 3,883,390, Cl. 156-584.000.

Cohen, Burton E., to General Instrument Corporation. Integrated circuit relaxation oscillator having minimal external pads. 3,883,825, Cl. 331-111.000.

Cohen, Leonard George; Cook, John Stone; and Schneider, Martin Victor, to Bell Telephone Laboratories, Incorporated. Splicing optical fibers. 3,883,353, Cl. 96-38.300.

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Cole, David R., to Allis-Chalmers Corporation. Vacuum capacitor switch having grounding switch means. 3,883,709, Cl. 200-144.00B.

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Condit, William C.; and Eccles, Samuel F., to United States of America, Energy Research and Development Administration. Apparatus for uniform pumping of lasing media. 3,883,819, Cl. 331-94.5PE.

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Cook, Alan Frederick, to Hoffmann-La Roche Inc. Process for the preparation of guanosine tetra- and penta-phosphates and products. 3,883,508, Cl. 260-211.50R.

Cook, John E.; Nicholson, Brian; and Dabbs, Lawrence S., to Norprint Limited. Adjustable facet print mechanisms. 3,882,773, Cl. 101-110.000.

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Cookston, Arthur M. Trolley multi-conductor system. 3,882,978, Cl. 191-32.000.

Cooley, Lush E. Welded railroad rail grinding apparatus. 3,883,323, Cl. 51-178.000.

Cooley, Richard F., to Owens-Illinois, Inc. Laser glass host compositions comprising TeO_2, La_2O_3 and ZnO. 3,883,357, Cl. 106-47.00R.

Cooper, Glenn D., to General Electric Company. Flame retardant composition of polyphenylene ether, styrene resin and trimesityl phosphate and process for the preparation thereof. 3,883,613, Cl. 260-874.000.

Copeland Corporation: *See—*
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Copithorne, Alton R., to Boston Machine Works Company. Platform binding strip pincher method and apparatus. 3,882,562, Cl. 12-24.500.

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Costes, Didier; and Picaut, Jack, to Commissariat a l'Energie Atomique. Method and device for positioning prestressing hoops. 3,882,585, Cl. 29-150.000.

Cotter, Douglas A., to Corning Glass Works. Image scanning converter for automated slide analyzer. 3,883,852, Cl. 340-172.500.

Cotton, John F., to Westinghouse Electric Corporation. Remote controlled circuit interrupter. 3,883,781, Cl. 317-14.00R.

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Hoskins, Douglas Haig; Horne, Thomas; Jarman, Graham Roger; and Dunsmore, Arthur William, 3,883,305.

Courier de Mere, Henri Edouard Francois Marie, to Bicosa-Societe de Recherches. Electronic device adapted to produce high voltage-pulses, especially for igniting a gas lighter. 3,883,246, Cl. 431-264.000.

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Covington, Edwin G. Smoking pipe. 3,882,876, Cl. 131-185.000.

Cowan, Larry Clyde: *See—*
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Cowdin, Lloyd D. Support- and -cutting-tool assembly. 3,882,741, Cl. 82-35.000.

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Crabb, Elmer R., to Caterpillar Tractor Company. Steering system with secondary steering means. 3,882,952, Cl. 180-79.20R.

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Crawford, Newton W. Electronic temperature sensor and indicator. 3,882,711, Cl. 73-362.0AR.

Creamer, John Elvin: *See*—
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Crim, Paul E.; and Warfield, Wayne, to Stryker Corporation. Drill-like driving device. 3,882,737, Cl. 74-665.00S.

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Croix, Louise S., to Airco, Inc. Fluorinated isopropyl derivatives as inhalation anesthesias. 3,883,665, Cl. 424-342.000.

Cronkright, Walter A., Jr.; and Mandelik, Bernard G., to Pullman Incorporated. Method of removing sulfur-containing gases from waste gas. 3,883,639, Cl. 423-242.000.

Crouch, Alfred E.: *See*—
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Cullen, Glenn Wherry; Bolin, Stephen Ray; Corboy, John Francis; Creamer, John Elvin; and Wasielewski, Alan John, to RCA Corporation. Modified czochralski-grown magnesium aluminate spinel and method of making same. 3,883,313, Cl. 23-301.0SP.

Cunningham, Thomas C., Jr., to Bendix Corporation, The. Field emission x-ray tube having a graphite fabric cathode. 3,883,760, Cl. 313-55.000.

Cusumano, Guy F., to Clarkson Industries, Inc. Dust collector for portable rotary disc grinder. 3,882,644, Cl. 51-170.00T.

Cutting, Dale Emerson; Womack, Richard Arthur; and MacGuffie, Joseph Vernon. Measurement of oxidation reduction potential in ore beneficiation. 3,883,421, Cl. 209-1.000.

Cyclotron Corporation, The: *See*—
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Dahl, Birger; and Hannestad, Arne Ludvig, to Aktieselskapet Borregaard. Apparatus for shredding baleformed compressed fiber material. 3,883,081, Cl. 241-281.000.

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Hozumi, Yukio; Ikeda, Saizo; and Hayaoka, Toshikazu, 3,883,616.
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Daigle, Donald J.; Drake, George L., Jr.; and Reeves, Wilson A., to United States of America, Agriculture. Phosphorus containing aromatic polymers and process for producing flame resistant textiles. 3,883,597, Cl. 260-606.50P.

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Danieli, Sten Henrik; and Sundstrand, Arne, to Allmanna Svenska Elektriska Aktiebolaget. Centrifugal machine for filling of powder capsules. 3,882,908, Cl. 141-34.000.

Daniels, Dennis, to U.S. Amada, Ltd. Vertical turret ironworker. 3,882,746, Cl. 83-552.000.

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Dare Products, Incorporated: *See*—
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Date, Tasuku; Yagi, Shizuo; and Miyaki, Kiyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Intake control for internal combustion engines. 3,882,831, Cl. 123-75.00B.

Datsko, George: *See*—
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Davies, Philip Hywel; Hobden, Maurice Vernon; Hulme, Kenneth Fraser; and Jones, Oliver, to National Research Development Corporation. Optical material. 3,883,752, Cl. 307-88.300.

Davis & Geck Australia Pty. Limited: *See*—
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Davis, Ralph A.; Tigner, Ronald G.; Pews, R. Garth; Exner, Jurgen H.; and Gibbons, Carl L., to Dow Chemical Company, The. Preparation of brominated pentaerythritols and esters utilizing certain dibasic acids. 3,883,581, Cl. 260-485.00G.

Davis, Robert Newton: *See*—
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Deborde, Albert. Device adaptable to the reed of a weaving loom. 3,882,903, Cl. 139-192.000.

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de Carbon, Christian Bourcier. Wheel suspensions. 3,883,152, Cl. 280-96.20R.

de Cremiers, Francois Augier, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Time multiplex frame correlation device. 3,883,729, Cl. 235-181.000.

Dedolph, Richard D., to United States of America, America as represented by the National Aeronautics and Space Administration. Rotary plant growth accelerating apparatus. 3,882,634, Cl. 47-1.200.

Dedrick, Robert L.: *See*—
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Degen, Donald S., to Stromberg-Carlson Corporation. Twisted conductor fabrication. 3,882,907, Cl. 140-149.000.

Dehn, Freddie H. Removable truck-mounted implement carrying frame and method of loading and unloading same. 3,883,020, Cl. 214-515.000.

Deigner, Paul: *See*—
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Raabe, Fritz; and de Jong, Eduard, 3,883,487.

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Delafield, Fredrick B., to Lane Company, Inc., The. Molded joint component for tubular frame furniture. 3,883,257, Cl. 403-172.000.

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Delbouille, Andre; and Derroitte, Jean-Louis, to Solvay & Cie. Process for the polymerization and copolymerization of olefins. 3,883,492, Cl. 260-88.20R.

DeLong, Vincent R.; and Craiglow, Robert L., to Rockwell International Corporation. Demodulator circuit for phase modulated communication signals. 3,883,806, Cl. 325-320.000.

Delorenzo, Anthony. Eyeglass frame with hearing aid. 3,883,701, Cl. 179-107.00S.

DelPercio, Michael J. Mounting installation for temperature sensing switch. 3,883,717, Cl. 219-328.000.

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De Mets, Albert, to Kronstrukiewerkhuizen de Mets N.V. Continuously operating rough or final press. 3,883,284, Cl. 425-371.000.

DeMets, Albert, to Konstruktiewerkhuizen DeMets N.V. Continuously operating press for chipboards, fiberboards, or the like. 3,883,285, Cl. 425-371.000.

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DeSchepper, Archille; and Van Peteghem, Antoine, to Metallurgie Hoboken-Overpelt. Liquid-liquid extraction of germanium from aqueous solution using hydroxy-oximes. 3,883,634, Cl. 423-89.000.

Determann, Fritz; and Zajadatz, Heinz, to Carl Zeiss-Stiftung. Telephoto lens objective. 3,883,229, Cl. 350-214.000.

Determann, Fritz; and Zajadatz, Heinz, to Carl Zeiss-Stiftung. Telephoto lens objective. 3,883,230, Cl. 350-214.000.

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DeVita, Peter Michael. Signal light adapter for trailers. 3,883,845, Cl. 340-67.000.

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Dhein, Rolf; Kaiser, Bernd-Ulrich; Rudolph, Hans; Kuchenmeister, Rolf; and Niehaus, Clemens, to Bayer Aktiengesellschaft. Binders for environmentally harmless laquer systems. 3,883,454, Cl. 260-22.00R.

Dickson, Robert A. Illuminated decorative display. 3,883,730, Cl. 240-10.60R.

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Dissinger, William K., to Plastaspec, Inc. Decorative wheel cover and retaining assembly therefor. 3,883,181, Cl. 301-37.00P.

Distel, Maurice. Self-contained navigation device. 3,882,603, Cl. 33-79.00A.

Dittman, Albert L., to Halocarbon Products Corporation. Production of 2,2,2-trifluoroacetyl chloride. 3,883,407, Cl. 204-158.00R.

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du Chambon, Michel G. J., to Locaner. Automotive unit for the collection and incineration of household or industrial refuse. 3,882,800, Cl. 110-14.000.

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Durand, Jean-Paul; Gillardeau, Jacques; and Faron, Robert, to Commissariat a l'Energie Atomique. High-performance emitter for thermoelectronic diodes. 3,883,765, Cl. 313-346.000.

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Fassman, Arnold; and Mersereau, Robert E. Punching and stapling apparatus. 3,883,063, Cl. 227-21.000.
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Fisher, Walter, to Texaco Canada Limited. Automatic drain valve for a floating roof. 3,883,032, Cl. 220-219.000.
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Flack, Max L.; Foshee, William R.; and Le Tourneau, Ralph E., to Best Lock Corporation. Attack-resistant padlock. 3,882,699, Cl. 70-38.00A.
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Fletcher, James C. Physical correction filter for improving the optical quality of an image. 3,883,436, Cl. 250-219.0QA.
Flicker, Howard D., to Singer Company, The. Wear-resistance of knitting machine support members. 3,882,695, Cl. 66-115.000.
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Fohl, Timothy, to GTE Sylvania Incorporated. Method of operating high intensity arc discharge lamp. 3,883,766, Cl. 313-220.000.
Fong, Andrew O. C.: *See*—
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Formwalt, Charles William; Frank, John Lewis; and Schneider, Allen Paul, to Deere & Company. Fluid actuated control device. 3,882,759, Cl. 91-167.000.
Fors, Torsten: *See*—
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Forsberg, K. Holger; Hamalainen, Lauri; Melaja, Asko J.; and Virtanen, Jouko Johannes, to Suomen Sokeri Osakeyhtio. pH adjustment in fructose crystallization for increased yield. 3,883,365, Cl. 127-60.000.
Forster, Hans-Joachim M.; Steinbrenner, Hans; Eltze, Georg; and Florus, Hans-Jorg, to Daimler-Benz Aktiengesellschaft. Process for controlling the working oil pressure as a function of engine torque for shifting elements of automatically shifted transmissions, especially for motor vehicles. 3,882,740, Cl. 74-866.000.
Fort, J. Robert; Westphal, James A.; and Juiles, Donald R., to Geophysical Systems Corporation. Data compositing and array control system. 3,883,725, Cl. 235-151.300.
Fortuna-Werke Maschinenfabrik AG: *See*—
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Fortune, William S. Temperature controlled soldering instrument. 3,883,716, Cl. 219-241.000.
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Foshee, William R.: *See*—
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Fox, Richard Q., to Westinghouse Electric Corporation. Roll eccentricity correction system and method. 3,882,705, Cl. 72-11.000.

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Francois, Robert E.; Davis, William R.; and Sandstrom, Wayne M., to United States of America, Navy. Torpedo control. 3,882,808, Cl. 114-20.00R.

Frank, Amalie Julianna, to Bell Telephone Laboratories, Incorporated. Uniform decoding of minimum-redundancy codes. 3,883,847, Cl. 340-146.10R.

Frank, John Lewis: *See*—
Formwalt, Charles William; Frank, John Lewis; and Schneider, Allen Paul, 3,882,759.

Franke, Bruno; Hallbauer, Erich; and Laue, Wolfgang, to BUSS Aktiengesellschaft. Producing concentrated hydrofluoric acid substantially free from impurities using polyether and polyol absorbents and nitrogen flushing gas. 3,883,642, Cl. 423-483.000.

Frazier, Wallace N. Bumper-actuated trigger mechanism for vehicle safety crash bag. 3,883,156, Cl. 280-150.0AB.

Frederickson, James D.; Hickman, Ella Sue; and Harper, Edward D., to R. J. Reynolds Tobacco Company. Tobacco expansion process. 3,882,874, Cl. 131-140.00P.

Free, John Marshall, to Hoffmann-La Rcche Inc. Free flow resonant cavity measuring apparatus. 3,883,798, Cl. 324-58.50C.

Freeborn, John C., to Honeywell, Inc. D to a converter with high-speed, transient-free switching circuitry. 3,883,865, Cl. 340-347.0DA.

Freisler, Erhard; and Jud, Karl, to Ruti Machinery Works Ltd. Adjustable sley sword pivoting bearing. 3,882,902, Cl. 139-190.000.

French, Stuart M.: *See*—
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French, William George; Pearson, Arthur David; and Tynes, Arthur Richard, to Bell Telephone Laboratories, Incorporated. Glass melting method. 3,883,340, Cl. 65-134.000.

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Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
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Schwarz, Wilhelm, 3,883,127.

Friedabaugh, Lee: *See*—
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Friedheim, Ernst Albert Hermann; and Duwel, Dieter, to Hoechst Aktiengesellschaft. Treatment of filariasis. 3,883,650, Cl. 424-245.000.

Friedrich Deckel Aktiengesellschaft: *See*—
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Frimberger, Eckart. Reanimation device. 3,882,860, Cl. 128-145.700.

Fritz, Charles H., to SGL Industries, Inc. Vehicle roll-over protection device. 3,882,957, Cl. 180-104.000.

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Fuchsel, Harald, to Veb Pentacon Dresden. Photographic camera having an accessories mounting shoe. 3,883,884, Cl. 354-126.000.

Fuhring, Heinrich; and Sieber, Johannes Helmut, to Bowe Bohler & Weber Maschinenfabrik. Method of and apparatus for the recovery of solvent gases from an air stream. 3,883,325, Cl. 55-20.000.

Fuji Photo Film Co., Ltd.: *See*—
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Fujikawa, Kanichi; Takahashi, Ryohei; Yokomichi, Isao; Kimura, Fumio; Kaji, Takeo; and Sakashita, Nobuyuki, to Ishihara Sangyo Kaisha Ltd. Method of tobacco sucker inhibition. 3,883,343, Cl. 71-78.000.

Fujikawa, Yasuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Cast piece supporting apparatus for a continuous casting machine. 3,882,924, Cl. 164-283.00R.

Fujikura Densen Kabushiki Kaisha: *See*—
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Fujimoto, Yasuo; Masumura, Isao; and Hashimoto, Yukio, to Kyowa Hakko Kogyo Co., Ltd. Resins containing dithioic acid groups. 3,883,490, Cl. 260-79.5NV.

Fujinaga, Taitiro; and Miura, Katuo, to Shibata Kagaku Kikai Kogyo Kabushiki. Detector of trace substance in water. 3,883,414, Cl. 204-195.00R.

Fujioka, Masayuki, to Leo Mfg. Co., Ltd. Piezo-electric type gas lighter. 3,883,289, Cl. 431-131.000.

Fujita, Teizo; and Kikuchi, Masao, to Izumi Denki Company Limited. Socket assembly. 3,883,210, Cl. 339-198.00S.

Fukami Co., Ltd.: *See*—
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Fukami, Toshihiro, to Fukami Co., Ltd. Method and apparatus for bandsawing operation with profiling mechanism capable of automatic copying of a model. 3,882,742, Cl. 83-56.000.

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Fulcher, Robert W.; and Sudey, John, to United States of America, General Counsel-Code GP. Low speed phaselock speed control system. 3,883,785, Cl. 318-314.000.

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Fuxe, Kjell, to Sandoz Ltd. Ergocornine or 2-bromo-α-ergocyptine in the treatment of parkinsonism. 3,883,655, Cl. 424-261.000.

Fuzzell, Joe E., to Caterpillar Tractor Company. Electronic component positioner for loader vehicles and the like. 3,883,783, Cl. 317-148.50R.

G. D. Searle & Co.: *See*—
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Gaburo, Isabelle R. Method of applying garment trim. 3,882,549, Cl. 2-244.000.

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Gagner, Joseph L. Belt buckle. 3,882,617, Cl. 40-21.00C.

Galantay, Eugene E., to Sandoz-Wander, Inc. 1-(2′,4′-Disubstituted-6′-ω-substituted-hexyl-1′-phenyl)-1-olefin-3-ols. 3,883,579, Cl. 260-473.00R.

Galbreath, Gerald W.; Dietrich, Alfred T.; and Mosbarger, George E., to Overhead Door Corporation. Door lock with safety release. 3,883,164, Cl. 292-92.000.

Galer, Abel, to SA Louise NV. Apparatus for de-slagging casting ladles. 3,883,124, Cl. 266-37.000.

Gall, Martin: *See*—
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Galmiche, Pierre Michel Andre; Jourdier, Henri Jacques; and Odeyer, Pierre Paul Louis, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device for programming the afterburning-initiation phase in a turbojet engine. 3,882,675, Cl. 60-243.000.

Gambell, James W.: *See*—
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Ganoung, David P. Capacitive discharge ignition system utilizing a feedback controlled oscillator. 3,882,839, Cl. 123-148.00R.

Garbini, Eraldo; Lissoni, Umberto; and Cislaghi, Bruno, to Saer di Trezzi Eduige. Apparatus for continuously joining or paper printing flat materials. 3,883,386, Cl. 156-380.000.

Garcia, Paulina P.: *See*—
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Garner, Paul Johnson; and Oxley, David Fairclough, to Imperial Chemical Industries Limited. Injection molding of laminar articles having a foam core and an integral skin. 3,883,629, Cl. 264-55.000.

Garrett, Clyde Barner; and Thayer, William Stansbury, to Koppers Company, Inc. Method and apparatus for accurate die-cutting. 3,882,745, Cl. 83-311.000.

Gash, Virgil W.; and Bissing, Donald E., to Monsanto Company. Preparation of monohaloacyl halides. 3,883,589, Cl. 260-544.00Y.

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Gattuso, Marion J.; and Arnold, Robert J., to Universal Oil Products Company. Thiocarbamyl sulfenamides. 3,883,592, Cl. 260-567.000.

Gawlick, Heinz; and Stahlmann, Rudolf, to Dynamit Nobel Aktiengesellschaft. Blank cartridge for training purposes. 3,882,778, Cl. 102-39.000.

Gawlick, Heinz; Stahlmann, Rudolf; and Jensen, Ernst, to Dynamit Nobel Aktiengesellschaft. Rifle grenade, particularly for firing tear gas or flare projectiles. 3,882,780, Cl. 102-65.200.

Gayler, Ronald, to United Kingdom Atomic Energy Authority. Reverse osmosis apparatus. 3,883,434, Cl. 210-330.000.

Gazzo, Joseph F. Building heating and cooling system. 3,882,928, Cl. 165-12.000.

Geary, Arthur L., to Brunswick Corporation. Twist drawn wire. 3,883,371, Cl. 148-32.000.

Gebel, Irving; and Enger, Michael H., to Controls Company of America. Timer switch assembly with independently controlled manual and motor driven cams. 3,883,708, Cl. 200-38.00R.

Gebo, Charles Henry, to Sybron Corporation. Controlled environment module. 3,883,715, Cl. 219-210.000.

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Geiger, Rolf, to Hoechst Aktiengesellschaft. Process for the manufacture of insulin, analogs and derivatives thereof. 3,883,496, Cl. 260-112.700.

Geiger, Rolf; and Jager, Georg, to Hoechst Aktiengesellschaft. Process for the manufacture of insulin, analogs and derivatives thereof. 3,883,500, Cl. 260-112.700.

Geisow, Bernard H.; and Harrelson, Lamon. Method and apparatus for impressing identifying characters into metal bar stock. 3,882,772, Cl. 101-4.000.

Geller, Ehud, to Ives Laboratories. Tablet formulation. 3,883,647, Cl. 424-15.000.

Gendron, Aubrey Stewart; and Ettel, Victor Alexander, to International Nickel Company, Inc., The. Electrodeposition of thick nickel deposits on permanent cathode blanks. 3,883,411, Cl. 204-12.000.

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Gerbig, Hans Erwin, to AEG-Elotherm GmbH. Electronic conveyor for molten metal with elevated pouring tube. 3,883,045, Cl. 222-372.000.

Gerster, John F., to Riker Laboratories, Inc. Substituted pyrido(1,2,3-de)-1,4-benzoxazines. 3,883,522, Cl. 260-244.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
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Gifford, Charles J., to Minnesota Mining and Manufacturing Company. Daylight-loading film-holder for exposing vertically disposed x-ray film. 3,883,746, Cl. 250-475.000.

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Giller, Solomon Aronovich; Dubur, Gunar Yanovich; Uldrikis, Yan Rikhardovich; Tirzit, Gunar Jamovich; Valdman, Andrei Robertovich; Zakharchenko, Ivan Markovich; Spruz, Yazep Yanovich; Ronis, Vitaly Evgenievich; and Makarov, Alexandr Andrejevich. Stabilization of carotene. 3,883,673, Cl. 426-311.000.

Gillessen, Dieter; Rudinger, Josef; and Studer, Rolf, to Hoffmann-La Roche Inc. [Ile^3, Leu^4]-vasopressin analogs. 3,883,498, Cl. 260-112.500.

Ginsberg, Guenter; Godin, Thomas John; and Simpson, Ronald Olin, to Coulter Electronics, Inc. Pinch valve construction. 3,882,899, Cl. 137-627.500.

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Glaser, Karl. Multiple rotary wafer type switch with axial bridging contacts and multiple wafer connecting ring. 3,883,706, Cl. 200-11.00A.

Glass, Frederic E. Retractable bed. 3,882,554, Cl. 5-10.00R.

Glasser, Herman, to Nuclear Associates, Inc. Combined holder and adapter for liquid scintillation counters. 3,883,745, Cl. 250-363.000.

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Glattli, Hans-Heinrich; and Klink, Walter, to Pneumotech AG. Program-carrier for use in fluid-operated programming systems. 3,882,895, Cl. 137-594.000.

Glaxo Laboratories Limited: *See*—
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Godley, Kevin Michael; and Creme, Laurence Neil. Apparatus for playing musical instruments. 3,882,754, Cl. 84-320.000.

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Goldfarb, Adolph E.; and Benkoe, Erwin. Doll with pneumatic means for reciprocally moving eyes. 3,882,631, Cl. 46-44.000.

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Goupy, Marcel; and Roubinet, Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Composite vehicle bumper. 3,883,168, Cl. 293-98.000.

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Green, Richard L., to Monsanto Company. Fire resistant jet fuel compositions. 3,883,319, Cl. 44-62.000.

Greene, Robin Nikolas; and Lewis, Kathrine Johnson, to du Pont de Nemours, E. I., and Company. Fast curing heat stable elastomeric compositions. 3,883,472, Cl. 260-42.520.

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Greis, Ulrich; and Helmberger, Josef, to Agfa-Gevaert Aktiengesellschaft. Method and arrangement for recording by a writing beam. 3,883,688, Cl. 178-6.70R.

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Grindle, James L.: *See—*
Peterson, David D.; and Grindle, James L., 3,883,732.

Grindle, Paul D. Apparatus and method for presentation of reading materials. 3,882,620, Cl. 40-343.000.

Gritschke, Martin; and Kretschmann, Bernd, to Zimmer Aktiengesellschaft. Device for suppressing bobbin vibrations in winding machines. 3,883,082, Cl. 242-18.00B.

Gross, Heinz; Wade, Harry C.; and Witts, John W. Method and apparatus for producing helical seam welded steel. 3,882,706, Cl. 72-17.000.

Gross, Otto: *See—*
Buchler, Joseph; Gross, Otto; and Parker, Bernard, 3,883,044.

Grossblatt, Gerald H. Zinc plating baths. 3,883,405, Cl. 204-55.00Y.

Grossner, Horst: *See—*
Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, 3,883,183.

Grove, Marvin H., to M & J Valve Company. Valve apparatus for pipe lines. 3,883,115, Cl. 251-366.000.

Grundstuckverwaltungsgesellschaft Muller & Co. KG: *See—*
Junker, Heinrich, 3,883,042.

Grundy, Reed H., to Westinghouse Air Brake Company. Fail-safe selectable low-pass filtering. 3,883,815, Cl. 330-21.000.

Gruppo Lepetit S.p.A.: *See—*
Bellasio, Elvio, 3,883,531.

GTE Automatic Electric (Canada) Ltd.: *See—*
Thomas, Robert M., 3,883,864.

GTE Automatic Electric Laboratories Incorporated: *See—*
Magnusson, Stig E., 3,883,857.

GTE Sylvania Incorporated: *See—*
Buescher, William E.; and Kerstetter, Donald R., 3,883,767.
Fohl, Timothy, 3,883,766.

Gugliotta, Paul F. Pipe-and-ball truss array. 3,882,650, Cl. 52-223.00R.

Guilino, Gunther, to Optische Werke G. Rodenstock. Automatic, recording refractometer. 3,883,233, Cl. 351-6.000.

Guillaud, Michel Pierre, to Societe Anonyme, Secmer la Tronche. Process for mixing two or more liquid or pastry products under high pressure and mixing head therefor. 3,883,121, Cl. 259-4.000.

Guillot, Jack, to Bennes Marrel. Rotary heat exchanger, in particular for a gas turbine. 3,882,926, Cl. 165-8.000.

Guldenbalk, Alexei Pavlovich; Ivchenko, Vitaly Ivanovich; Kazakevich, Teodor Iosifovich; Koslov, Leonid Pavlovich; Kolosov, Vladimir Grigorievich; Kolosova, Ninel Iosifovna; Melekhin, Viktor Fedorovich; Popandopulo, Leonid Semenovich; Chechurin, Sergei Leonidovich; Ivanov, Pavel Sergeevich; Korolev, Vyacheslav Semenovich; Kushinikov, Vadim Nikolaevich; Sokolov, Vladimir Fedorovich; and Chiganov, Vyacheslav Anatolievich. Device for numerical programmed control. 3,883,787, Cl. 318-569.000.

Gulla, Peter; and Schutzenauer, Dieter, to Daimler-Benz Aktiengesellschaft. Device for level and/or temperature control of liquids. 3,882,967, Cl. 184-103.00R.

Gullino, Pietro M.: *See—*
Knazek, Richard A.; Gullino, Pietro M.; Dedrick, Robert L.; and Kidwell, William R., 3,883,393.

Gunderson, Leslie C., to Corning Glass Works. Coupler for optical communication system. 3,883,222, Cl. 350-96.00C.

Gurevich, Samuil; Zamkov, Vadim Nikolaevich; Prilutsky, Valery Pavlovich; Topolsky, Vladimir Filippovich; Podkopai, Nikolai Vasilievich; Dykhno, Semen Leonidovich; and Manoilo, Sergei Afanasievich. Flux cored electrode. 3,883,713, Cl. 219-146.000.

Gutehoffnungshutte Sterkrade Akt.: *See—*
Fischer, Hans; and Hellendrung, Herbert, 3,883,711.

Guthrie, James L.; and Dighe, Shrikant V., to W. R. Grace & Co., Washington Research Center. Oxy, hydroxy containing aliphatic sulfides. 3,883,598, Cl. 260-609.00R.

Gutshall, Charles E., to Elco Industries, Inc. Controlled-drive sealing fastener. 3,882,752, Cl. 85-1.0JP.

Haake, Gerhard: *See—*
Meyer, Frank; Jankowski, Alfons; Glaesmann, Otto-Ernst; and Haake, Gerhard, 3,882,684.

Haas-Jordan Company: *See—*
Waltz, H. Franklin, 3,882,880.

Hackmack, Gerhard; and Menge, Heinz Gunter, to Byk Gulden Lomberg Chemische Fabrik GmbH. Basic quinobenzazepines compositions and methods of use. 3,883,654, Cl. 424-258.000.

Hacoba-Textilmaschinen GmbH & Co. KG: *See—*
Amend, Werner, 3,883,302.

Hafele, Robert X.: *See—*
Kinslow, William G., Jr.; Marchant, Paul A.; Bessier, Robert D.; and Hafele, Robert X., 3,883,286.

Hager, Robert Bonner; Toukan, Sameeh Said; and Walter, Gerald Joseph, to Pennwalt Corporation. Fluorine and sulfur-containing compositions. 3,883,596, Cl. 260-609.00R.

Hahne, Walter B., to Pre-Cast Concrete Products, Limited. Mold for making meter box covers and the like. 3,883,109, Cl. 249-91.000.

Hakes, Gary A., to Caterpillar Tractor Company. Automatic retarder control system. 3,882,973, Cl. 188-181.00R.

Hall, John H., to Micro Power Systems, Inc. Silicon-oxygen-nitrogen layers for semiconductor devices. 3,883,889, Cl. 357-73.000.

Hall, Robert P., Sr., to Arvin Industries, Inc. Drive for magnetic recording disc or tape cassettes. 3,883,090, Cl. 242-199.000.

Hallamore Inc.: *See—*
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Hallbauer, Erich: *See—*
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Haller, Kurt H.: *See—*
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Halmschlag, Otto: *See—*
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Halocarbon Products Corporation: *See—*
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Hamaker, Ralph A., to Xerox Corporation. Sleeveless pressure roll cleaner. 3,883,292, Cl. 432-60.000.

Hamalainen, Lauri: *See—*
Forsberg, K. Holger; Hamalainen, Lauri; Melaja, Asko J.; and Virtanen, Jouko Johannes, 3,883,365.

Hamilton, Clayton H., to Conifer Laboratories, Inc. Method for testing pregnancy. 3,883,304, Cl. 23-230.00B.

Hamilton, Pamela M., to Dow Chemical Company, The. 4-Amino-3,5,6-trichloro-2-(functionally substituted methyl) pyridine compounds. 3,883,541, Cl. 260-295.00R.

Hammarlund, Bertil; and Juhlin, Lars-Erik, to Allmanna Svenska Elektriska Aktiebolaget. Direct current power transmission. 3,883,790, Cl. 321-2.000.

Hammerschmied, Georg. Carburetor for internal combustion engines. 3,883,621, Cl. 261-78.00R.

Hamuro, Junji, to Ajinomoto Co., Inc. Method of solubilizing polysaccharides. 3,883,505, Cl. 260-209.00R.

Hanas, Bertil; and Marchner, Jan, to Allmanna Svenska Elektriska Aktiebolaget. Electric arc furnace having side-wall lining protection. 3,883,677, Cl. 13-35.000.

Hance, Richard J.: *See—*
Clark, Alexander H.; and Hance, Richard J., 3,882,727.

Hanford, William E., to World Water Resources, Inc. Portable water supply system. 3,883,429, Cl. 210-104.000.

Hanke, David E., to Kimberly-Clark Corporation. Water-dispersible plastic tampon insertion tubes and the like. 3,882,869, Cl. 128-263.000.

Hannestad, Arne Ludvig: *See—*
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Hansen, O. Duane, Jr. Power actuated folding goose neck trailer. 3,883,019, Cl. 214-506.000.

Hanson, Alden B.; and Hanson, Chris A., to Hanson Industries Inc. Method of fitting a ski boot. 3,882,561, Cl. 12-142.00P.

Hanson, Chris A.: *See—*
Hanson, Alden B.; and Hanson, Chris A., 3,882,561.

Hanson Industries Inc.: *See—*
Hanson, Alden B.; and Hanson, Chris A., 3,882,561.

Hanssen, Tore B.; and Ditzig, Albert F., to Controls Company of America. Headlight dimmer switch. 3,883,710, Cl. 200-156.000.

Hansson, Gunnar Christer, to Atlas Copco Aktiebolag. Hoist. 3,883,119, Cl. 254-168.000.

Harada, Tetuya: *See—*
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Hardesty, Richard H. Method for forming tabulating card sets. 3,883,130, Cl. 270-18.000.

Hardtmann, Goetz E., to Sandoz-Wander, Inc. Certain substituted-tricyclic quinazolin-thiones used as brochodilators. 3,883,652, Cl. 424-251.000.

Hare, Robert B.: *See—*
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Harnish, Dennis J.: *See—*
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Harper, Chester H.: *See—*
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Harper, Edward D.: *See—*
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Harrelson, Lamon: *See—*
Geisow, Bernard H.; and Harrelson, Lamon, 3,882,772.

Harris, Bernard; Johnson, Russell P.; and Lambert, Gerald G., to Rexnord, Inc. Valve body. 3,883,114, Cl. 251-366.000.

Harris-Intertype Corporation: *See—*
Anderson, Ohmer, Jr.; and Stephens, Robert Eugene, 3,883,131.

Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Dren, Anthony Thomas, to Sharps Associates. 5,5-Dimethyl-10-hydroxy-8-(3-methyl-2-octyl)-2-(2-propynyl)-1,2,3,4-tetrahydro-5h-[1]-benzopyrano[3,4-d]pyridine as a sedative hypnotic. 3,883,657, Cl. 424-263.000.

Harris, Robert C.; and Meyer, Helmut P., to Bendix Corporation, The. Electrical discharge device comprising an insulator body having an electrically semi-conducting coating formed thereon. 3,883,762, Cl. 313-130.000.

Harrison, Clarence E., Jr.; and Yun, Siang-Shen Johnson, to Ford Motor Company. Thermocouple-failure warning circuit. 3,883,753, Cl. 307-117.000.

Harrison, Dean R.; and Dimeff, John, to United States of America, General Counsel-Code GP. Diode-quad bridge circuit means. 3,883,812, Cl. 329-166.000.

Hart, John Austin: *See—*
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Hart, Ralph H.: *See—*
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Hart, William S. Advertising and display device. 3,882,618, Cl. 40-125.00H.

Hartman, John M.: *See—*
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Harvey, Barry J., to Carborundum Company, The. Refractory insulating compositions. 3,883,359, Cl. 106-64.000.

Harvey, Edwin Dennis, to Imperial Chemical Industries Limited. Anthraquinone dyestuffs. 3,883,567, Cl. 260-379.000.

Hasbro Industries, Inc.: *See—*
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Hashimoto, Junichi: *See—*
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Hashimoto, Yukio: *See—*
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Haslam, Bryan S.: *See—*
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Hass, Wynn M., to Southwire Company; and National Steel Corp. Anode press with vibration and compaction rate sensing means. 3,883,278, Cl. 425-135.000.

Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, to Omron Tateisi Electronics Co. Information input device. 3,883,867, Cl. 340-365.00R.

Hathaway, Lucille. Diaper. 3,882,870, Cl. 128-284.000.

Hatzitheodorou, George Christou. Flushing device for dental bridges. 3,882,865, Cl. 128-232.000.

Hauffe, William L.: *See—*
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Hausner, Robert: *See—*
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Haven, Herm L.: *See—*
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Haverkamp, Wilhelm, to Heinrich Koppers GmbH. Device for gasification of solid fuels. 3,883,321, Cl. 48-73.000.

Hayaoka, Toshikazu: *See—*
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Hayes, Thomas E.: *See—*
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Hayward Baker Company: *See—*
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Hazelwood, Loren Richard. Dual line bowstring server. 3,882,662, Cl. 57-10.000.

Hearn, William Rouse. Flowmeter. 3,882,724, Cl. 73-215.000.

Heartz, Robert A., to General Electric Company. Digital data base generator. 3,883,861, Cl. 340-324.00R.

Hebert, Remy, to Aquitaine Total Organico. Process for the polymerization of dodecalactam in the presence of potassium carbonate. 3,883,608, Cl. 260-78.00L.

Heckner, Helmut, to Wacker Werke KG. Vibration plate system. 3,883,260, Cl. 404-133.000.

Hecla Mining Company: *See—*
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Hedwall, Phyllis Roberta, to Ciba-Geigy Corporation. Pharmaceutical preparations for the treatment of hypertonia. 3,883,656, Cl. 424-263.000.

Hegewaldt, Fritz; Mauve, Hans Werner; and Erdmann, Otto, to BBC Brown Boveri & Company Limited. Induction type crucible furnace. 3,883,678, Cl. 13-27.000.

Heil Co., The: *See—*
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Hein, Allyn John, to Caterpillar Tractor Company. Cast piston with hollow core and head cover. 3,882,762, Cl. 92-181.000.

Heinberg, Gary R.; Jones, Darryl S.; and Wright, Thomas R., to International Business Machines Corporation. Interleaved memory control signal and data handling apparatus using pipelining techniques. 3,883,854, Cl. 340-172.500.

Heine, Joseph, to Robert Bosch G.m.b.H. Spark advance mechanism for ignition distributors of internal combustion engines. 3,882,836, Cl. 123-117.00A.

Heinrich Baumgarten, Eisen- und Blechwarenfabrik: *See—*
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Heinrich Koppers GmbH: *See—*
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Heising, Steven James; Dowley, Mark W.; and Shull, William A., to Coherent Radiation. Metal-vapor laser with improved vapor condensing means. 3,883,818, Cl. 331-94.50G.

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Hekimian, Norris C., to Hekimian Laboratories, Inc. Line conditioner with independent gain and delay control. 3,883,830, Cl. 333-28.00R.

Helava, Uuno V., to Bendix Corporation, The. Single photo epipolar scan instrument. 3,883,251, Cl. 356-203.000.

Held, Franz. Roll slitting and winding machine. 3,883,085, Cl. 242-65.000.

Helgesson, Claes Ivar; Persson, Sven Borje Stellan; and Nilsson, Hans-Olof Ingvar, to Stig Arbman AB. Method of manufacturing a glass object by molding and sintering glass powder. 3,883,337, Cl. 65-31.000.

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Helmer, Jerry D.; and Hughes, Kenneth E., to Battelle Memorial Institute. Artificial muscle. 3,882,551, Cl. 3-1.000.

Helmlinger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Sigg-Grutter, Trudi; and Wild, Jost, to Givaudan Corporation. Novel mercaptoderivatives of ionones and irones. 3,883,572, Cl. 260-455.00R.

Hendrickson, Luther G.; and Ravasio, Dino, to United States Steel Corporation. Briquette mold pocket configuration. 3,883,110, Cl. 249-187.000.

Hendry, George O., to Cyclotron Corporation, The. Electrostatic extraction method and apparatus for cyclotrons. 3,883,761, Cl. 313-62.000.

Henmi, Kojiro: *See—*
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Henry Simon Limited: *See—*
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Henzl, Milan R.; and Roszkowski, Adolph P., to Syntex Corporation. Method for delaying the onset of, or postponing, parturition. 3,883,662, Cl. 424-333.000.

Hepp, Wolfgang; Pimiskern, Klaus; and Herbert, Werner, to Dornier System GmbH. Pedestal bearing with spiral grooves in the bearing gliding plane. 3,883,193, Cl. 308-9.000.

Heraeus-Schott Quarzschmelze GmbH: *See—*
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Herendi, Norbert: *See—*
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Hermann, Arthur D.; and Riedesel, Edwin L., to Caterpillar Tractor Company. Resilient engine mount with self-locating means. 3,883,099, Cl. 248-9.000.

Hermann, Arthur D.; Hurt, William C., II; and Miers, Bruce W., to Caterpillar Tractor Company. Resilient engine mount and alignment means and method therefor. 3,883,100, Cl. 248-9.000.

Hermann, Robert. Pick-proof lock mechanism. 3,882,703, Cl. 70-419.000.

Hermann, Walter; Kraus, Peter; and Steinmetz, Gunter, to Messerschmitt-Bolkow-Blohm GmbH. Arrangement for guiding together of two traffic streams. 3,883,098, Cl. 246-167.00R.

Herrera, Frank J., to Casa Herrara, Inc. Flour dough sheet forming and conveying systems. 3,883,283, Cl. 425-337.000.

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Heslop, Lorne C. Stack forming mechanism. 3,883,010, Cl. 214-9.000.

Hess, Garry Carson, to Bell Telephone Laboratories, Incorporated. Fault testing of logic circuits. 3,883,801, Cl. 324-73.00R.

Hess, Hans-Jurgen E.; Czuba, Leonard J.; and Schaaf, Thomas K., to Pfizer Inc. Tetrazoyl derivatives of naturally occurring prostaglandins. 3,883,513, Cl. 260-240.00R.

Hester, Jackson B., Jr.; and Gall, Martin, to Upjohn Company, The. Preparation of triazolybenzophenones. 3,883,544, Cl. 260-296.00R.

Heuser, Gordon D.; and Pennell, Rolla J. Therapeutic manipulating machine for the human body. 3,882,856, Cl. 128-57.000.

Heusler, Karl; Bickel, Hans; Fechtig, Bruno; Peter, Heinrich; and Scartazzini, Riccardo, to Ciba-Geigy Corporation. 8-oxo-5-thia-1-azabicyclo(4,2,0)oct-2-ene compounds. 3,883,517, Cl. 260-243.00C.

Hewson, Kenneth E. Plastic dowel pin and wood joint assembly. 3,883,258, Cl. 403-298.000.

Heyer, David Edward, to du Pont de Nemours, E. I., and Company. Apparatus for making polymeric film. 3,883,279, Cl. 425-141.000.

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Higuchi, Masaru; Ohnishi, Hajime; and Yagihara, Hiroshi, to Daicel Ltd. Styrene resin composition containing epoxy lubricants. 3,883,464, Cl. 260-30.40R.

Hildebrand, Karl-Heinz. System for purifying and disinfecting waste water. 3,883,432, Cl. 210-152.000.

Hilgers, Thomas M. Bracket setting tool. 3,883,064, Cl. 227-120.000.

Hill, Albert Charles, to Girling Limited. Automatic slack adjuster for a vehicle brake. 3,882,974, Cl. 188-196.00D.

Hill, Charles E.: *See—*
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Hill, George P. Movie film cleaning system. 3,882,568, Cl. 15-308.000.

Hill, John B., to G. D. Searle & Co. 3-Arylthioalkyl-4-optionally substituted sydnones. 3,883,548, Cl. 260-307.00A.

Hiller, Donald E., to Rayne International. Water cooler. 3,882,693, Cl. 62-394.000.

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Hofer, Heinz; and Chaudhry, Sushil, to DEMAG Kunststofftechnik Gesellschaft mit beschrankter Haftung. Injection unit for an injection molding machine. 3,883,047, Cl. 222-413.000.

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Hoffman, Richard A., to Westinghouse Electric Corporation. Protective anti-reflective coatings for alkali-metal halide optical components. 3,883,214, Cl. 350-1.000.

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Johnson, Paul Richard; Rothrock, Elmer Weyman; Lange, Kenneth Wilson; Kircik, Willis James; and Davis, Robert Newton, to Chicago Bridge & Iron Company. Storage vessel for ship transport of liquefied gas. 3,882,809, Cl. 114-74.00A.

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Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Grigory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,883,078.

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Kaenel, Reginald A.; and Crouch, Alfred E., to AMF Incorporated. Method and apparatus for measuring curvature and curvature variations in pipelines and the like. 3,882,606, Cl. 33-174.00L.

Kain, Calvin L. Wheel hub cap for skate wheels. 3,883,180, Cl. 301-5.300.

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Kanai, Toshio; Noguchi, Masaaki; Yanagioka, Hiroshi; Kogawa, Yosio; and Kondo, Susumu, to Chiyoda Chemical Engineering & Construction Co., Ltd. Reaction crystallizer. 3,883,311, Cl. 23-273.00R.

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Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Grigory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,883,078.

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Kano, Kazuyoshi. Sheet for bedding. 3,882,559, Cl. 5-334.00R.

Kansas State University Research Foundation: *See—*
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Keen, William A., Jr., to General Electric Company. High voltage electrical bushing incorporating a central conductor expandable expansion chamber. 3,883,680, Cl. 174-12.0BH.

Keenan, Bernard J., Jr., to Sun Oil Company of Pennsylvania. Combination laser beam and sonic drill. 3,882,945, Cl. 175-16.000.

Keglewitsch, Josef, to Bunker Ramo Corporation. Contact for multiple conductor connector. 3,883,212, Cl. 339-276.00A.

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Kelley, Patricia Alexandra; and Kelley, Alan Brian. Racing board game apparatus. 3,883,143, Cl. 273-134.0CH.

Kendziora, Keinz; Nenner, Johannes; Schoer, Heinz; and Schultze, Werner, to Vereinigte Aluminium-Werke AG. Method of flux-free soldering of aluminum-containing workpieces in a controlled atmosphere. 3,882,596, Cl. 228-200.000.

Kennametal Inc.: *See—*
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Khaidurov, Efim Leontievich; and Razorenov, Vladimir Alexandrovich. Sighting device for sporting firearms. 3,882,623, Cl. 42-1.00S.

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Kim, Young Ho. Automatic swing operated by electricity. 3,883,136, Cl. 272-86.000.

Kim, Young Ho, to Ambac Industries Inc. Gas analyzer resistance element. 3,883,307, Cl. 23-254.00E.

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Kirk, Harry V.; and Rudy, Manfred, to Kirk-Rudy, Inc. Labeling machine. 3,883,385, Cl. 156-352.000.

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Kita, Yuzo; and Inose, Fumiyuki, to Hitachi, Ltd. Memory utilizing magnetic bubble domain device. 3,883,849, Cl. 340-172.500.

Kiteley, Terence J., to Zenith Radio Corporation. Four-lead tuning capacitor for television deflection system. 3,883,779, Cl. 315-379.000.

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Klein, Erwin; and Lucke, Herbert, to Siemens Aktiengesellschaft. Electronic ignition angle measuring apparatus. 3,883,795, Cl. 324-16.00R.

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Knazek, Richard A.; Gullino, Pietro M.; Dedrick, Robert L.; and Kidwell, William R., to United States of America, Health, Education and Welfare. Cell culture on semi-permeable tubular membranes. 3,883,393, Cl. 195-1.800.

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Kohler, Wolfgang, to Akademie der Wissenischaften der DDR. Commutatorless motor. 3,883,633, Cl. 310-152.000.

Koizumi, Tsohimichi, to Olympus Optical Company Limited. Objective lens systems for use in microscopes. 3,883,231, Cl. 350-220.000.

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Kollbach, Wilhelm, to Mannesmannrohren-Werke AG; Kraftwerk Union AG; and Sandvik Aktiebolaget. Jet sand blasting of bent tubes or rods. 3,882,639, Cl. 51-14.000.

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Konig, Karl-Heinz, to Voko-Franz & Co. Desk having electrical supply lines which are laid in the table. 3,883,202, Cl. 312-223.000.

Koning, Menno G., to Northrop Corporation. Torquer scale factor temperature correction means. 3,882,731, Cl. 73-497.000.

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Kopetz, Kurt; Ziegenbein, Willi; and Schick, Anton, to Chemische Werke Huels Aktiengesellschaft. Fire-retardant polyolefin compositions. 3,883,481, Cl. 260-45.75B.

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Krausz, Francois; and Brunaud, Marcel Daniel Pierre, to C M Industries. 4-(4'-Cyclohexyl-3'-chlorophenyl)-γ-butyrolactone. 3,883,563, Cl. 260-343.600.

Kressel, Henry; and Lockwood, Harry Francis, to RCA Corporation. Efficiency light emitting diode. 3,883,888, Cl. 357-16.000.

Kretschmann, Bernd: *See—*
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Kriebel, Anthony R., to American Optical Corporation. Noncontacting pressure measuring apparatus. 3,882,718, Cl. 73-80.000.

Krieg, Manfred; and Wohnhas, Adolf, to Rohm GmbH. Resin masses comprising a methyl methacrylate polymer matrix and a styrene polymer disperse phase. 3,883,617, Cl. 260-883.000.

Kroenke, William J., to B. F. Goodrich Company, The. Flame and smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 3,883,480, Cl. 260-45.75C.

Kroenke, William J., to B. F. Goodrich Company, The. Flame and smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 3,883,482, Cl. 260-45.75F.

Krohn, Hellmut: *See—*
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Krupen, Philip, to United States of America, Army. Capacitance fuze. 3,882,781, Cl. 102-70.20P.

Kube, Leonard J., to General Atomic Company. Heat exchanger. 3,882,933, Cl. 165-163.000.

Kuchenmeister, Rolf: *See—*
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Kudo, Teizo; Tokuhara, Shinji; and Chata, Keiichi, to Daicel Ltd. Flame-retardant impact-resistant resin composition. 3,883,615, Cl. 260-876.00R.

Kuebel, Erwin: *See—*
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Kugua, Hisasi: *See—*
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Kumagai, Yoshio, to Hitachi, Ltd. Means for cleaning heat conductive conduits of a heat exchanger. 3,882,931, Cl. 165-95.000.

Kume, Tadashi; and Shinmura, Kimio, to Honda Giken Kogyo Kabushiki Kaisha. Combustion chamber device for internal combustion engines. 3,882,830, Cl. 123-75.00B.

Kunz, William J., to Hughes Aircraft Company. System for phase aligning parallel signal processing channels. 3,883,870, Cl. 343-17.700.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
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Kurochkin, Fedor Filippovich: *See—*
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Kurtz, Robert L., to United States of America, General Counsel-Code GP. Holographic system for non-destructive testing. 3,883,215, Cl. 350-3.500.

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Laguna, Louis; and Langlois, Christian, to Regie Nationale des Usines Renault. Method of determining the correction components of the out-of-balance weight, making any angle between them, on a dynamic balancing machine. 3,882,730, Cl. 73-462.000.

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Lamparsky, Dietmar, to Givaudan Corporation. 4-N-batyroxymethyl-1,3-dioxolanes. 3,883,558, Cl. 260-340.900.

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Lancia, Frederick N.; Kesterson, Albert O.; and Liebert, Ralf C. Bridge circuit for environmental condition control. 3,883,757, Cl. 307-311.000.

Landes, Raymond L.; and Le Gros, Floyd F., to Libbey-Owens-Ford Company. Apparatus for simultaneously breaking a plurality of frangible sheets. 3,883,056, Cl. 225-104.000.

Lane, Charles Robert. Dispensor for vintage wines. 3,883,043, Cl. 222-82.000.

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Langille, Donald W., deceased (by Langille, Olive I., petitioner), to International Telephone and Telegraph Corporation. Products from plicatic acid and process. 3,883,564, Cl. 260-345.200.

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Lazarev, Vladimir Fedorovich: *See—*
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Lazow, Malcolm. Golf tee. 3,883,144, Cl. 273-183.00A.

Lechner, Walter L., to Engler Instrument Company. One-way direction control for synchronous motors. 3,883,758, Cl. 310-41.000.

Lee, Tzuo-Chang, to Honeywell, Inc. Holographic memory having spherical recording medium. 3,883,216, Cl. 350-3.500.

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Le Tourneau, Ralph E.: *See—*
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Libbey-Owens-Ford Company: *See—*
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Limbacher, Bernhard; and Fadler, Kurt, to Fichtel & Sachs AG. Self-aligning clutch release bearing arrangement. 3,882,979, Cl. 192-98.000.

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Lohaus, Gerhard; and Dittmar, Walter, to Hoechst Aktiengesellschaft. Certain 1-hydroxy-2-pyridones. 3,883,545, Cl. 260-297.00Z.

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Lohr, Delmar F., Jr.; and Kay, Edward Leo, to Firestone Tire & Rubber Company, The. Stabilization of polybutadiene resin. 3,883,460, Cl. 260-23.70R.

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Lukstas, Edward, to Varisystems Corporation. Paper tape reader. 3,883,723, Cl. 235-61.11E.

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Lynn, John R.; and Tate, George W., Jr. Computer controlled apparatus for automatic visual field examination. 3,883,234, Cl. 351-23.000.

Lynn, John R.; and Tate, George W., Jr. Automatic visual field examination including fixation monitoring compensation. 3,883,235, Cl. 351-39.000.

Lytle, Gerald H.; and Littleton, F. John, to World Color Press, Inc. Registration system for thin magnetic printing plates. 3,882,775, Cl. 101-415.100.

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MacKenzie, Donald D.; and Russell, John L., to American Chain & Cable Company, Inc. Pneumatic transmitter of electrical phenomena. 3,882,881, Cl. 137-14.000.

Macklyn, Bruce A., to Zero Gage Company. Spline measuring unit. 3,882,604, Cl. 33-147.00K.

Macklyn, Bruce A., to Zero Gage Company. Differential-probe hole-location or concentricity gauge. 3,882,608, Cl. 33-174.00Q.

Maertens, Dieter; Lehnert, Gunther; and Zimmermann, Manfred, to Bayer Aktiengesellschaft. Process and catalyst for ring opening polymerisation. 3,883,495, Cl. 260-93.100.

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Mahaffy, John W.; and Haven, Herm L., to Continental Can Company, Inc. Snap-on lid. 3,883,036, Cl. 220-306.000.

Mai, Horst, to Maschinenfabrik Ausburg-Nuremberg Aktiengesellschaft Werk Nuremberg. Device for cooling rotor blades with solid profile of motor vehicle gas turbines. 3,883,263, Cl. 415-116.000.

Maisch, Wolfgang, to Robert Bosch G.m.b.H. Compensation of side wind forces tending to undesirably move a vehicle laterally. 3,882,953, Cl. 180-79.200.

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Makinsky, Ismail Zelfugarovich; Kasimzade, Enver Akhmedogly; and Baksht, Samuil Petrovich. System for thermal desalting of water. 3,883,400, Cl. 202-180.000.

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Manoogian, Alex; and Pullen, Eric V., to Masco Corporation. Mixing valve. 3,882,897, Cl. 137-625.400.

Mansour, Momtaz N.; Wayland, Harold J.; and Chapman, Carl P., to United States of America, General Counsel-Code GP. Servo-controlled intravital microscope system. 3,883,689, Cl. 178-7.200.

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Marforio, Nerino, to S.p.A. Virginio Rimoldi & C. Cover thread pulling and take-up device for multineedle sewing machines. 3,882,806, Cl. 112-243.000.

Margolis, Joseph. Billfold. 3,882,916, Cl. 150-38.000.

Margraf, Adolf. Pocket filter apparatus. 3,883,330, Cl. 55-341.000.

Mariotti, Jean Francois; Blanc, Jean Henri; and Thibault, Claude, to Societe Nationale des Petroles d'Aquitaine. Manufacture of thiophenols. 3,883,599, Cl. 260-609.00D.

Marmo, Anthony B. Traffic staging control system. 3,883,842, Cl. 340-41.00R.

Martin, Donald L., to General Electric Company. Nickel-lanthanum alloy produced by a reduction-diffusion process. 3,883,346, Cl. 75-.5BA.

Martin, Eugene Ray, to Stauffer Chemical Company. Silicone release agent. 3,883,628, Cl. 264-54.000.

Martin, Thomas B.; and Herscher, Marvin B., to Threshold Technology, Inc. Programmable word recognition apparatus. 3,883,850, Cl. 340-172.500.

Martinez, Robert Joe. Clip on auto door guard. 3,882,574, Cl. 24-73.00B.

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Mastrolia, Edmund J.; Frost, Charles B.; and Wessler, Gerald A., to Aerojet - General Corporation. Solid propellant compositions containing polymeric binders with aziridinyl curing agents. 3,883,375, Cl. 149-19.900.

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Mathews, George P.; and Hutter, Robert B. Breather cap apparatus for a spring-actuated brake mechanism. 3,883,030, Cl. 220-204.000.

Matlen, Abraham J. Automatic oven. 3,882,766, Cl. 99-327.000.

Matschke, Klaus; Rauterkus, Karl Josef; Seip, Detlev; and Zimmermann, Wolfgang, to Hoechst Aktiengesellschaft. Process for the preparation of a dispersible vinyl acetate/ethylene polymer powder. 3,883,489, Cl. 260-78.50R.

Matsui, Shooichi: *See—*
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Matsumoto, Reizou. Load handling equipment. 3,883,105, Cl. 248-281.000.

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Maudlin, Lloyd Z., to United States of America, Navy. Method and apparatus for aiding in solution of three-dimensional fire control problems. 3,883,070, Cl. 235-61.50B.

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McAtee, Richard W.; and Svaldi, Marvin A., to Marathon Oil Company. Mobility control in adjacent wellbores. 3,882,939, Cl. 166-274.000.

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McCain, David L., to Continental Oil Company. Method of handling a large diameter slurry hose system. 3,882,885, Cl. 137-344.000.

McCarroll, Alan F., to Xerox Corporation. Electrostatographic web feeding apparatus. 3,882,744, Cl. 83-262.000.

McCarroll, Alan F., to Xerox Corporation. Pressure roll construction. 3,883,293, Cl. 432-60.000.

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McCaully, Ronald J., to American Home Products Corporation. Intermediates for the preparation of 1,3-dihydro-2H-1,4-benzodiazepin-2-ones. 3,883,591, Cl. 260-562.00N.

McClymont, Ian W.; and Parekh, Sharad V., to International Standard Electric Corporation. Endfire commutated antenna array. 3,883,875, Cl. 343-106.00D.

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McFadden, Vergil. Method and apparatus to meter forage. 3,882,825, Cl. 119-20.000.

McFalls, Patrick M.; McCarty, David W.; and Hare, Robert B., to Beloit Corporation. Method for handling tie rods on an injection molding machine. 3,882,588, Cl. 29-427.000.

McGee, William M.; and Melder, Jesse H. Combined booklet and score card with tear-out score grid. 3,883,161, Cl. 283-50.000.

McGlynn, Thomas P.; and Yentsch, Carl H., to Continental Can Company, Inc. Carton corner construction. 3,883,067, Cl. 229-31.0FS.

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McIntier, Edwin Ralph, to Sweitzer, Richard G. Automatic pallet car conveyor. 3,882,792, Cl. 104-162.000.

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McNaughton, Lawrence S.; Rhoades, John M.; Erler, Irvin L.; and Watkins, Kenneth M., to General Electric Company. Pulse width modulated servo system. 3,883,786, Cl. 318-317.000.

McShane, James L., to Westinghouse Electric Corporation. Multiple time difference ultrasonic flowmeters. 3,882,722, Cl. 73-194.00A.

Mead, Dennis E., to Lipe Rollway Corporation. Vibratory bar feeder. 3,882,993, Cl. 198-26.000.

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Miller, J. R., to Southern Railway Company. Spike pulling mechanism. 3,883,118, Cl. 254-18.000.
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Moore, Clyde T.; and Mercer, Harry L., to J. P. Stevens & Co. Inc. Process for reducing shrinkage and improving crease retention of wool-synthetic fiber blends. 3,883,300, Cl. 8-115.700.

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Mori, Chiharu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electric shutter control circuit for single lens reflex cameras. 3,883,882, Cl. 354-51.000.

Mori, Yasuki; and Sato, Moriyuki, to Kyowa Hakko Kogyo Co., Ltd. Process for preparing 5-hydroxy-tryptophan and its derivatives. 3,883,554, Cl. 260-326.14T.

Morin, Benoit L., to Morard Pulpwood Company Limited. Method for delimbing felled trees. 3,882,913, Cl. 144-309.0AC.

Morita, Masayuki, to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Device for automatically compensating failure of a lamp. 3,883,777, Cl. 315-88.000.

Morrison, Howard J., to Marvin Glass & Associates. Baseball type game apparatus. 3,883,139, Cl. 273-89.000.

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Morton, William G. Safety helmet with individualized head-contoured liner. 3,882,546, Cl. 2-3.00R.

Mosbarger, George E.: *See—*
Galbreath, Gerald W.; Dietrich, Alfred T.; and Mosbarger, George E., 3,883,164.

Moser, Heinz: *See—*
Karpf, Kurt; and Moser, Heinz, 3,882,550.

Mossbarger, George E.: *See—*
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Mosyakov, Evgeny Alexandrovich; Rtischev, Jury Vasilievich; Berer, Efim Zakharovich; Leus, Vladimir Markovich; Lukeev, Viktor Petrovich; Rodionov, Evgeny Markovich; Levitsky, Vladimir Lvovich; Akopyan, Vladimir Surenovich; Mindlin, Jury Yakovlevich; Balashov, Evgeny Ivanovich; Kinkulkin, Isaak Efimovich; Shumakova, Galina Petrovna; Fedotov, Evgeny Tikhonovich; and Lazarev, Vladimir Fedorovich. Method of unambiguous detecting the position of moving object, also ground station and receiver display of radio navigation system for effecting same. 3,883,873, Cl. 343-103.000.

Motoren-und Turbinen-Union Munchen GmbH: *See—*
Bauerfeind, Klaus, 3,882,672.

Motorola, Inc.: *See—*
Alberkrack, Jade H., 3,883,807.

Mowbray, Kenneth D., to Electro Sprayer Systems, Inc. Powder coating construction. 3,882,818, Cl. 118-312.000.

MRM Industries, Inc.: *See—*
Kopernicky, Jaroslav, 3,883,057.

Muccillo, Edwin J.: *See—*
Reiley, Bertrand M.; Muccillo, Edwin J.; and Griffith, Robert G., 3,882,595.

Mueller Co.: *See—*
Leopold, Wilbur R., Jr.; Floren, Carl E.; and Hauffe, William L., 3,882,884.

Mueller, Dietrich-Wolfgang; Klug, Hans; Bronstert, Klaus; and Grah, Lieselore, to BASF Aktiengesellschaft. Flatting agents for coatings. 3,883,458, Cl. 260-28.50R.

Mueller, James P.: *See—*
Barton, James C.; Mueller, James P.; and Carter, John W., 3,883,172.

Mulholland, Thomas Patrick Cunningham, to Imperial Chemical Industries Limited. Ester of α-tocopherol. 3,883,565, Cl. 260-345.500.

Muller, Anton, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Tire chain. 3,882,918, Cl. 152-213.00R.

Muller, Jean, to Societe d'Etudes de Genie Civil et de Techniques Industrielles. Process for construction of bridges, in particular motorway flyovers. 3,882,564, Cl. 14-77.000.

Muller, Johann, deceased (by Muller, Katharina, legal representative), to Friedrich Deckel Aktiengesellschaft. Tool spindle having a clamping device for milling tools. 3,882,758, Cl. 90-11.00A.

Muller, Katharina, legal representative: *See—*
Muller, Johann, deceased, 3,882,758.

Muller, Peter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method of spinning yarns in spinning turbines. 3,882,666, Cl. 57-156.000.

Murashige, Robert H.; and Myers, Henry L., to Minnesota Mining and Manufacturing Company. X-ray intensifying screen. 3,883,747, Cl. 250-483.000.

Murayama, Seiichi: *See—*
Kaji, Tetsunori; and Murayama, Seiichi, 3,883,778.

Murphy, Francis P.; and Parker, Robert E., to Westinghouse Canada Limited. Line tracer. 3,883,735, Cl. 250-202.000.

Murphy, John D.; Pirro, John, Jr.; Lawrence, Monsey; and Wisla, Stanley F., to Atcor Inc. Apparatus for fixing radioactive waste. 3,883,441, Cl. 252-301.10W.

Murray, Coyt E., to Impact Plastics, Incorporated. Method and means for making high molecular weight polyethylene sheets. 3,883,631, Cl. 264-210.00R.

Music Man, Inc.: *See—*
Walker, Thomas A., 3,883,195.

Musinski, Donald F.: *See—*
Matzek, Norman E.; and Musinski, Donald F., 3,883,644.

Musschoot, Albert, to General Kinematics Corporation. Vibratory material handling apparatus. 3,882,996, Cl. 198-220.0DB.

Myers, Henry L.: *See—*
Murashige, Robert H.; and Myers, Henry L., 3,883,747.

Myers, Howard B.: *See—*
Jackson, Hewy E.; and Myers, Howard B., 3,882,594.

Mylari, Banavara L., to Pfizer Inc. Thermal rearrangement of 3-aryloxytriazine-5(4H)-ones. 3,883,525, Cl. 260-248.0AS.

Mylari, Banavara L., to Pfizer Inc. Preparation of 2(aryl)-as-triazine-3,5(2H,4H)-dione coccidiostats. 3,883,528, Cl. 260-248.0AS.

Nada, Naohiro; and Yamashita, Tadaoki, to Matsushita Electric Industrial Co., Ltd. Phosphor for thermoluminescent type radiation dosimeter. 3,883,748, Cl. 250-484.000.

Nadella: *See—*
Pitner, Alfred, 3,883,194.

Nagano, Akira: *See—*
Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, 3,883,867.

Nagashima, Wakio: *See—*
Tamai, Yasuo; Osawa, Sadao; Honjo, Satoru; Umehara, Akira; Yamamoto, Masaya; Tsuji, Nobuo; Takashina, Naomitsu; and Nagashima, Wakio, 3,883,440.

Nagata, Yasunori: *See—*
Ishizawa, Kazutomo; Nagata, Yasunori; and Ikui, Hisakazu, 3,883,309.

Nagayama, Masuzo; and Okada, Hiroshi, to Lion Fat & Oil Co., Ltd. Oil soluble anionic surface active agent. 3,883,583, Cl. 260-513.00R.

Nagayama, Masuzo: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,883,587.

Nagel, Erich: *See—*
Zangenfeind, Helmut; and Nagel, Erich, 3,883,086.

Nagel, Robert I., to Voevodsky, John. Optical construction of a lens. 3,883,733, Cl. 240-106.100.

Nakamichi, Niro, to Nakamichi Research, Inc. Dual capstan type tape driving mechanism for a magnetic tape machine. 3,883,059, Cl. 226-108.000.

Nakamichi Research, Inc.: *See—*
Nakamichi, Niro, 3,883,059.

Nakamoto, Teruyuki; Shingo, Yoshioki; Yamaguchi, Tetsuo; and Endo, Yukio, to Fujikura Densen Kabushiki Kaisha. Catalyst assembly for removing noxious gases from automobile exhaust. 3,883,443, Cl. 252-447.000.

Nakanishi Metal Works Co., Ltd.: *See*—
Wakabayashi, Takao, 3,882,793.

Nakanishi, Taro; Takagi, Katsumi; and Ametani, Teiji, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus of applying skids of grating structure and removing the same. 3,883,013, Cl. 214-16.40A.

Nakayama, Hirokazu: *See*—
Inamoto, Yoshiaki; Takaku, Masaaki; Nakayama, Hirokazu; and Taniguchi, Morimasa, 3,883,603.

Narita, Keizo: *See*—
Yamaguchi, Toshiaki; Narita, Keizo; and Wada, Kimihiro, 3,883,084.

Narr, Berthold: *See*—
Woitun, Eberhard; Narr, Berthold; and Schroter, Wolfgang, 3,883,651.

Naruse, Takeo; Hashimoto, Junichi; and Oikawa, Hideaki, to Pentel Kabushiki Kaisha. Mechanical pencil. 3,883,253, Cl. 401-65.000.

Nash, Alan Richard Brine. Arcuately oscillating damper. 3,882,976, Cl. 188-306.000.

National Forge Company: *See*—
Bowles, Arnold G., 3,882,589.

National Lead Company: *See*—
Caldon, Frank R.; Pimentel, Joseph E.; and Lewis, Clifford J., 3,883,345.

National Research Development Corporation: *See*—
Davies, Philip Hywel; Hobden, Maurice Vernon; Hulme, Kenneth Fraser; and Jones, Oliver, 3,883,752.

National Steel Corp.: *See*—
Hass, Wynn M., 3,883,278.

Natural Energy Systems, Inc.: *See*—
Uzzell, Rudyard S., Jr., 3,883,750.

Nauflett, George W.; and Johnson, Craig E., to United States of America, Navy. Nitroester propellant, casing, and liner of an epoxy-polyamide copolymer containing a stabilizer. 3,882,784, Cl. 102-103.000.

NCR Corporation: *See*—
Bishop, John J., 3,883,470.
Farber, Sheldon; and Wright, Arthur J., 3,883,557.
Liles, George N., 3,882,985.

Neary, Donald M.; and Doremus, John A., to Rosemount Inc. Vane type airflow sensor. 3,882,721, Cl. 73-188.000.

Nebgen, William H., to Brayton Cycle Improvement Associaton. Gasification method with fuel gas cooling. 3,882,671, Cl. 60-39.020.

Necchi, S.p.A.: *See*—
Bianchi, Nereo, 3,882,805.

Neely, James E., Jr.: *See*—
Michalik, Edmund R.; and Neely, James E., Jr., 3,883,339.

Neikam, William C., to Sun Ventures, Inc. Olefin hydrogenation using H_xMoO_3. 3,883,607, Cl. 260-683.900.

Nelson, James P., to Standard Oil Company. Copolyester(ethylene terephthalate/tetramethylene dibromoterephthalate) a new block polymer. 3,883,611, Cl. 260-860.000.

Neme, Fuhad Abdala. Self-supporting, totally combustible unit. 3,883,317, Cl. 44-14.000.

Nenner, Johannes: *See*—
Kendziora, Keinz; Nenner, Johannes; Schoer, Heinz; and Schultze, Werner, 3,882,596.

Nestenius, Nils Olof. Machines for stitching cushions, mattresses and the like. 3,883,163, Cl. 289-18.000.

Newall, Christopher Earle: *See*—
Phillipps, Gordon Hanley; Newall, Christopher Earle; and Cook, Martin Christopher, 3,883,569.

Newman, Ritchey O., Jr., to Dow Chemical Company, The. Impact absorbing structure. 3,882,970, Cl. 188-1.00C.

Newstead, Charles; and Wright, Andrew Charles Walden, to Girling Limited. Disc brake with identical removable friction pads. 3,882,972, Cl. 188-72.500.

Newton, John S., to Portec, Inc. Rail anchor. 3,883,072, Cl. 238-338.000.

NHK Spring Co., Ltd.: *See*—
Takatsu, Yukihiro, 3,883,125.

Nicholls, Lawrence George, to Girling Limited. Gas springs. 3,883,126, Cl. 267-65.00R.

Nicholson, Brian: *See*—
Cook, John E.; Nicholson, Brian; and Dabbs, Lawrence S., 3,882,773.

Niehaus, Clemens: *See*—
Dhein, Rolf; Kaiser, Bernd-Ulrich; Rudolph, Hans; Kuchenmeister, Rolf; and Niehaus, Clemens, 3,883,454.

Nieroba, Alfred: *See*—
Hock, Karl; Nieroba, Alfred; and Weiper, Karl Heinz, 3,882,820.

Nilsson, Hans-Olof Ingvar: *See*—
Helgesson, Claes Ivar; Persson, Sven Borje Stellan; and Nilsson, Hans-Olof Ingvar, 3,883,337.

Ninagawa, Sadayoshi; and Takeshita, Shito, to Ajinomoto Co., Inc. Method of stabilizing organic compounds against oxidation with dopa or dopa derivatives. 3,883,674, Cl. 426-544.000.

Nippon Airwick Service Co., Ltd.: *See*—
Nishida, Kazuko; Bota, Kazuji; and Ando, Tadao, 3,882,713.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 3,882,751.

Nippon Steel Corporation: *See*—
Kawamoto, Toshiharu; Itoh, Yoji; Hiyoudo, Kouji; and Fukushima, Kenya, 3,882,709.

Nire, Naomichi, to Sumitomo Metal Industries Limited. Charging coke oven blended coal and an overlay of briquettes. 3,883,399, Cl. 201-6.000.

Nishida, Kazuko; Bota, Kazuji; and Ando, Tadao, to Nippon Airwick Service Co., Ltd. Device for measuring sensuous degree of odor. 3,882,713, Cl. 73-23.000.

Nishikawa, Takfhiko: *See*—
Kaneko, Yuichiro; and Nishikawa, Takfhiko, 3,882,955.

Nishimura Seisakusho Co., Ltd.: *See*—
Yamaguchi, Toshiaki; Narita, Keizo; and Wada, Kimihiro, 3,883,084.

Nishimura, Takeshi: *See*—
Nishizawa, Jun-Ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,883,862.

Nishizawa, Jun-Ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, to Semiconductor Research Foundation and Hitachi, Ltd. Signal collecting and distributing systems. 3,883,862, Cl. 340-324.00M.

Nissan Motor Company Limited: *See*—
Horie, Masakazu; Fukuhara, Takao; and Harada, Tetuya, 3,882,837.
Hosaka, Akio; and Baba, Kosaku, 3,882,958.
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Watanabe, Takeaki; Sakasegawa, Hiroshi; and Tanabe, Kuniyuki, 3,882,692.

Nitanda, Hiroshi: *See*—
Ito, Yoshio; Katayama, Hamime; Nitanda, Hiroshi; and Yamaguchi, Masaru, 3,883,240.

Nobelius, Gustav, to Bruun & Sorensen AB. Frameworks for shielding devices. 3,883,297, Cl. 432-249.000.

Noguchi, Masaaki: *See*—
Kanai, Toshio; Noguchi, Masaaki; Yanagioka, Hiroshi; Kogawa, Yosio; and Kondo, Susumu, 3,883,311.

Nomura, Yasushi: *See*—
Unuma, Nobumitsu; and Nomura, Yasushi, 3,883,250.

Norel, Guy; and Desbrandes, Robert, to Institut Francais du Petrole, des Carburants et Lubrifiants. Localized method and device for the precise determination of the acoustic impedance of material situated in proximity to the wall of a borehole. 3,883,841, Cl. 340-15.50A.

Norprint Limited: *See*—
Cook, John E.; Nicholson, Brian; and Dabbs, Lawrence S., 3,882,773.

North Hants Engineering Company Limited: *See*—
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Northrop Corporation: *See*—
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Nuclear Associates, Inc.: *See*—
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Nulph, Robert J.: *See*—
Anderson, Arnold L.; and Nulph, Robert J., 3,883,479.

Nummedal, Kjell; Holscher, Donald J.; Hartman, John M.; and Erb, Darrell M., to Hughes Aircraft Company. Monolithic IR detector arrays with direct injection charge coupled device readout. 3,883,437, Cl. 250-332.000.

Nutten, Warren D.; and Phillips, Bernard C., to Borg-Warner Corporation. Charge forming method and apparatus with overspeed governor. 3,882,838, Cl. 123-127.000.

Obermann, George; and Willigman, John, to Controls Company of America. Two-speed constant drive timer. 3,882,734, Cl. 74-337.500.

O'Brien, Harry C.; Rubino, James V.; and Smith, Herbert J., to Burroughs Corporation. Address generator for rotating data storage devices. 3,883,853, Cl. 340-172.500.

O'Brien, Thomas Francis; and Hodges, Jimmie Ray, to Pennwalt Corporation. Process for recovering electrolytically produced alkali metal chlorates. 3,883,406, Cl. 204-95.000.

Occidental Petroleum Corp.: *See*—
Morey, Booker W.; and McKinley, John Richard, 3,883,635.

Ocean Systems, Inc.: *See*—
March, Frank Adams; and Brown, Louis Stanislaus, 3,883,433.

Odeyer, Pierre Paul Louis: *See*—
Galmiche, Pierre Michel Andre; Jourdier, Henri Jacques; and Odeyer, Pierre Paul Louis, 3,882,675.

Odier, Jean, to Societe Anonyme Francaise du Ferodo. Crosslinked polybenzoxazole copolymer and a process for preparing the same. 3,883,610, Cl. 260-841.000.

Oehler-Syhlen-Lagertechnik A.G.: *See*—
Grebenstein, Hermann, 3,883,022.

Ogle, Robert W., to IMS Limited. Trans-a-jet 1. 3,882,909, Cl. 141-286.000.

Ogura, Iwao: *See*—
Yamazaki, Eiichi; Maruyama, Koichi; Ueda, Toshio; and Ogura, Iwao, 3,883,880.

Ohara, Akira; and Takahashi, Masa. Submerged hot gas heat exchanger. 3,882,844, Cl. 126-360.00A.

Ohgoshi, Akio; Miyaoka, Senri; and Katagiri, Yosihiharu. Collinear electron gun system including accelerating grid having greater effective thickness for off axis beams. 3,883,771, Cl. 313-412.000.

Ohlson, John E.: *See*—
United States of America, National Aeronautics and Space Administration; Ohlson, John E.; and Williams, William F., 3,883,872.

Ohnishi, Hajime: *See*—
Higuchi, Masaru; Ohnishi, Hajime; and Yagihara, Hiroshi, 3,883,464.

Ohsaki, Kiyoshi; and Takahashi, Morio, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating cam device for internal combustion engine. 3,882,832, Cl. 123-90.600.

Oikawa, Hideaki: *See—*
Naruse, Takeo; Hashimoto, Junichi; and Oikawa, Hideaki, 3,883,253.

Okada, Hiroshi: *See—*
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Okazaki, Isao: *See—*
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Okumura, Takatoshi: *See—*
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 3,882,751.

Oland, Bradley H.: *See—*
Morton, Harvey L.; and Oland, Bradley H., 3,883,731.

Oldham, Robert R.; and Wooddell, John H., to Robert R. Oldham, Inc. Floating solids return device. 3,883,427, Cl. 210-73.000.

Olin Corporation: *See—*
Larchar, Trescott B., Sr.; and Scott, Robert N., 3,883,609.
Shapiro, Stanley; and Caron, Ronald N., 3,882,712.
Turley, Richard J., 3,883,620.

Olivier, Andre, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Gold alloy electroplating bath. 3,883,409, Cl. 204-44.000.

Ollman, Melvin L., to C-O, Inc. Truss construction. 3,882,653, Cl. 52-694.000.

Olson, Floyd B.: *See—*
Olson, Gordon G., 3,883,041.

Olson, Gordon G., to Olson, Floyd B.; and Karjala, Les R., part interest to each. Ammunition cartridge dispenser. 3,883,041, Cl. 221-227.000.

Olson, Harry W.: *See—*
Sebastian, Robert W.; Olson, Harry W.; and Silberg, Thomas F., 3,883,705.

Olson, Robert E.; and Thumim, Arnold David, to Packard Instrument Company, Inc. Scintillation counter, segmented shield. 3,883,742, Cl. 250-328.000.

Olstowski, Franciszek, to Dow Chemical Company, The. Rapid setting polyurethanes from diols and polyfunctional polyisocyanates prepared in the presence of carboxylic acid esters. 3,883,465, Cl. 260-31.200.

Olstowski, Franciszek, to Dow Chemical Company, The. Rapid setting polyurethanes from diols and polyisocyanates prepared in the presence of an organic carbonate. 3,883,466, Cl. 260-32.200.

Olstowski, Franciszek, to Dow Chemical Company, The. Rapid setting polyurethanes from diols and polyisocyanates in the presence of a hydroxyl-containing halogenated aliphatic compound. 3,883,484, Cl. 260-77.5MA.

Olympus Optical Company Limited: *See—*
Koizumi, Tsohimichi, 3,883,231.

Omega, Louis Brandt & Frere S.A.: *See—*
Schnyder, Edouard; and Liengme, Marcel, 3,883,314.

Omron Tateisi Electronics Co.: *See—*
Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, 3,883,867.

Ono, Kazuyuki Ray, to Bellco Glass, Inc. Microculture slide chamber. 3,883,398, Cl. 195-127.000.

Optische Werke G. Rodenstock: *See—*
Guilino, Gunther, 3,883,233.

Orlando, Carl. High-speed shutter. 3,883,885, Cl. 354-258.000.

Orlomoski, Roger W., to Litton Industrial Products, Inc. Self-locking thread. 3,882,917, Cl. 151-22.000.

Ormat Turbines (1965) Ltd.: *See—*
Bronicki, Lucien Yehuda, 3,882,929.

Osafune, Etsuko: *See—*
Kamide, Kenji; Manabe, Seiichi; Osafune, Etsuko; and Sakamoto, Tomio, 3,883,626.

Osawa, Sadao: *See—*
Tamai, Yasuo; Osawa, Sadao; Honjo, Satoru; Umehara, Akira; Yamamoto, Masaya; Tsuji, Nobuo; Takashina, Naomitsu; and Nagashima, Wakio, 3,883,440.

Osborne, Richard Carroll: *See—*
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Oshinski, Charles C.: *See—*
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Osofsky, Irving B., to United States of America, Army. Transpiration cooled nose cone. 3,883,096, Cl. 244-117.00A.

Osteen, Carl M., to General Electric Company. Ballast transformer with heat dissipating device. 3,883,834, Cl. 336-61.000.

Oswald, Alexis A.; Valint, Paul L.; and Schmit, George N., to Ciba-Geigy AG. O-alkyl-s-alkyl-o-(1-hydrocarbyloxy carbonyl-1-propen-2-yl)dithiophosphates. 3,883,618, Cl. 260-941.000.

Otis Engineering Corporation: *See—*
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Otsuki, Akira: *See—*
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Otto Engineering, Inc.: *See—*
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Otto, Jefferey B.: *See—*
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Otto, Peter H.: *See—*
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Smith, Vernon O.; and Mossbarger, George E., 3,882,563.

Owens-Illinois, Inc.: *See—*
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Garner, Paul Johnson; and Oxley, David Fairclough, 3,883,629.

Oyler, Herbert J., deceased; and by Oyler, Margaret Frances, executrix. Automatic cooking apparatus. 3,882,767, Cl. 99-339.000.

Oyler, Margaret Frances, executrix: *See—*
Oyler, Herbert J., deceased; and Oyler, Margaret Frances, executrix, 3,882,767.

Ozone, Koho; and Randmere, Uno, to Stromberg-Carlson Corporation. Linear phase filter with determinable gain characteristic. 3,883,833, Cl. 333-70.00R.

Pachmayr, Frank A.; and Miller, Edward B., to Pachmayr Gun Works, Inc. Apparatus for cutting pattern in gun stock or other work piece. 3,882,911, Cl. 144-136.00J.

Pachmayr Gun Works, Inc.: *See—*
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Pagon, John A.; and Erwin, Spotz, to Electromagnetic Industries, Inc. Ground fault sensor current transformer. 3,883,835, Cl. 336-90.000.

Pailer, Matthias; Takacs, Friedrich; and Streicher, Wolfgang, to Rowa Wagner KG. Dioxolanes and oxathiolanes. 3,883,538, Cl. 260-293.670.

Palmer, Ronald S. Sweep frequency control apparatus and method. 3,883,868, Cl. 340-408.000.

Pannell, Calvin E., to Dow Chemical Company, The. Pyridyl azides and derivatives thereof. 3,883,542, Cl. 260-295.00R.

Pantke, Heinz-Dieter; and Pohl, Ulrich, to Thyssen Niederrhein AG Hutten- und Walzwerke. Apparatus for the reduction of iron ores by direct reduction. 3,883,123, Cl. 266-29.000.

Papai, Imre F. Pastry shell filling apparatus. 3,883,079, Cl. 241-94.000.

Papajewski, Reinhold: *See—*
Schmedtkord, Ultich; Saile, Roland Franz; and Papajewski, Reinhold, 3,883,262.

Pappajtion, Alexandra G.: *See—*
Peck, Robert L.; Otto, Jefferey B.; and Pappajtion, Alexandra G., 3,883,784.

Pardes, Herman I., to United States of America, Army. High speed line scanner. 3,883,683, Cl. 178-6.000.

Parekh, Sharad V.: *See—*
McClymont, Ian W.; and Parekh, Sharad V., 3,883,875.

Parker, Bernard: *See—*
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Parker, Robert E.: *See—*
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Pars, Harry G.: *See—*
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Pars, Harry George: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Dren, Anthony Thomas, 3,883,657.

Parsons, Ian William: *See—*
Burdon, James; Coe, Paul Leslie; Parsons, Ian William; and Tatlow, John Colin, 3,883,559.

Parton, Brian, to Imperial Chemical Industries Limited. Triazine derivatives of triphenodioxazines. 3,883,523, Cl. 260-246.00R.

Paschenko, Nikolai Konstantinovich: *See—*
Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Grigory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,883,078.

Pass, Roger D. Valve actuators. 3,882,760, Cl. 91-422.000.

Paul, Keith: *See—*
McCarthy, John; and Paul, Keith, 3,883,049.

Paulson, Donald W.; and Harnish, Dennis J., to Emerson Electric Co. Open coil electric heater assembly. 3,883,721, Cl. 219-532.000.

Paxall, Inc.: *See—*
Silver, Stanley Milton, 3,883,068.

Payne, Alan James: *See—*
Drake, John Alfred; Payne, Alan James; and Reichert, Andrew Ronald, 3,883,851.

Peacock, Roy Norman, to Granville-Phillips Co. Anti-wear thin film coatings and method for making same. 3,882,579, Cl. 29-95.00R.

Pearson, Arthur David: *See—*
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Pearson, Glenn A. Novel resinous compositions comprising sequential reaction product of formaldehyde, inorganic acid, triethanolamine and urea. 3,883,462, Cl. 260-29.40R.

Pearson, Ian, to Minnesota Mining and Manufacturing Company. Fluorescent aryl 3,3-pyrazolyl-2-pyrazolines. 3,883,549, Cl. 260-310.00D.

Pearson, James M.; and Yanus, John F., to Xerox Corporation. 2-Vinyl-(9-dicyanomethylene) fluorene and derivatives thereof. 3,883,488, Cl. 260-78.40N.

Peck, Robert L.; Otto, Jefferey B.; and Pappajtion, Alexandra G., to Peck, Robert L. Electrical device with high dielectric constant. 3,883,784, Cl. 317-258.000.

Peckham, Victor A., Jr. Bicycle power brake. 3,882,971, Cl. 188-24.000.

Peiffner, Albert; and Schwieter, Ulrich, to Hoffmann-La Roche Inc. Epithio compounds. 3,883,514, Cl. 260-240.00H.

Pel Limited: *See*—
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Pelletier, Guy, to Bombardier Limited. Method and apparatuses for retreading worn tires. 3,883,382, Cl. 156-96.000.

Pelofsky, Arnold H., to Cities Service Research & Development Co. In situ production of bitumen from oil shale. 3,882,941, Cl. 166-303.000.

Peltola, Waino; and Braski, Ervin W. Timber harvester. 3,882,910, Cl. 144-3.00D.

Pennell, Anthony Robin, to Associated Portland Cement Manufacturers Limited, The. Hopper installation. 3,883,011, Cl. 214-17.00B.

Pennell, Rolla J.: *See*—
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Pennings, Henricus Jacobus; and Herendi, Norbert, to Lever Brothers Company. Pourable cream concentrate. 3,883,670, Cl. 426-568.000.

Pennwalt Corporation: *See*—
Hager, Robert Bonner; Toukan, Sameeh Said; and Walter, Gerald Joseph, 3,883,596.
O'Brien, Thomas Francis; and Hodges, Jimmie Ray, 3,883,406.

Penny, Robert Noel. Seal for rotary regenerative heat exchanger. 3,882,927, Cl. 165-9.000.

Penquite, Charles R.: *See*—
Roth, James F.; Gambell, James W.; and Penquite, Charles R., 3,883,445.

Pentel Kabushiki Kaisha: *See*—
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Peos, Charles E., to A. E. Staley Manufacturing Co. Non-bleeding vinylidene chloride copolymer coatings. 3,883,455, Cl. 260-23.0XA.

Perego, Gianluca, to Perego-Pines S.p.A. Baby carriage frame. 3,883,149, Cl. 280-36.00B.

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Perlotto, George T. Locking means for firearms. 3,882,622, Cl. 42-1.0LP.

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Persson, Eric J.: *See*—
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Persson, Sven Borje Stellan: *See*—
Helgesson, Claes Ivar; Persson, Sven Borje Stellan; and Nilsson, Hans-Olof Ingvar, 3,883,337.

Peter, Heinrich: *See*—
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Peterson, David D.; and Grindle, James L. Ceiling luminaire. 3,883,732, Cl. 240-73.0BC.

Petrochko, Robert P.; and Hayes, Thomas E., to Union Carbide Corporation. Method of forming thermoplastic matrix including preheating of thermoplastic blanks. 3,883,632, Cl. 264-322.000.

Pews, R. Garth: *See*—
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Pezzolo, Donald E.: *See*—
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Pfiz, Albert, to Walther Buromaschinen GmbH. Device for reversing the direction of drive of an inked ribbon in a high-speed printer. 3,882,774, Cl. 101-336.000.

Pfizer Inc.: *See*—
Barth, Wayne E., 3,883,653.
Brennan, Thomas M., 3,883,527.
Hess, Hans-Jurgen E.; Czuba, Leonard J.; and Schaaf, Thomas K., 3,883,513.
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Phillipps, Gordon Hanley; Newall, Christopher Earle; and Cook, Martin Christopher, to Glaxo Laboratories Limited. Novel 3α-hydroxysteroids of the 5α-pregnane series. 3,883,569, Cl. 260-397.450.

Phillips, Arthur P.; and Burrows, Robert B., to Burroughs Wellcome Co. Method of treating nematode infestations. 3,883,658, Cl. 424-270.000.

Phillips, Bernard C.: *See*—
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Phillips, Richard B., to International Paper Company. Treatment of lignocellulosic material with an aqueous containing cyanide ions and an alkaline earth metal salt. 3,883,391, Cl. 162-70.000.

Picaut, Jack: *See*—
Costes, Didier; and Picaut, Jack, 3,882,585.

Pickle, Jack Lamar, Jr., to Farah Manufacturing Company, Inc. Rotary valve for a position sensing. 3,882,898, Cl. 137-625.240.

Pilc, Randolph John; and Schlanger, Gabriel Gary, to Bell Telephone Laboratories, Incorporated. Junction unit alternatively providing branch line broadcasting and exclusive two-branch interconnection. 3,883,691, Cl. 178-73.000.

Pilc, Randolph John: *See*—
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Pimentel, Joseph E.: *See*—
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Pirkle, James C., Jr.: *See*—
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Pitner, Alfred, to Nadella, a part interest. Device for mounting a radial rolling bearing. 3,883,194, Cl. 308-184.000.

Pitre, Davide: *See*—
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Plantif, Bernard: *See*—
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Plasser, Erna; Theurer, Josef; and Egleseer, Franz. Mobile track survey apparatus. 3,882,607, Cl. 33-174.00R.

Plastaspec, Inc.: *See*—
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Raabe, Fritz; and de Jong, Eduard, 3,883,487.

Platt, Gerald. Energy responsive thread. 3,883,298, Cl. 8-2.000.

Plegat, Alain Edouard, to Societe Anonyme des Usines Chausson. Suspension device for vehicle drivers cab. 3,882,956, Cl. 180-89.00A.

Plevak, Lubomir: *See*—
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Plonsker, Larry: *See*—
Malec, Robert E.; and Plonsker, Larry, 3,883,501.

Plum, Raymond W. Pruning shears. 3,882,599, Cl. 30-270.000.

Plymale, Richard W. Composition in method for treating teeth. 3,882,600, Cl. 32-15.000.

Pneumatic Scale Corporation: *See*—
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Pneumotech AG: *See*—
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Podcameni, Abelardo; Goncalves, Aldo Alves; and Kirk, Sebastiao. Safety system for controlling the start-up of elevators. 3,882,969, Cl. 187-29.00R.

Podkopai, Nikolai Vasilievich: *See*—
Gurevich, Samuil; Zamkov, Vadim Nikolaevich; Prilutsky, Valery Pavlovich; Topolsky, Vladimir Filippovich; Podkopai, Nikolai Vasilievich; Dykhno, Semen Leonidovich; and Manoilo, Sergei Afanasievich, 3,883,713.

Pohl, Ulrich: *See*—
Pantke, Heinz-Dieter; and Pohl, Ulrich, 3,883,123.

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Polaert, Remy Henri Francois, to U.S. Philips Corporation. Method of forming microchannel plates having curved microchannels. 3,883,335, Cl. 65-4.000.

Polanco, Julio R. Apparatus and method for mounting dental casts. 3,882,602, Cl. 32-32.000.

Polaroid Corporation: *See*—
Bloom, Stanley M.; and Garcia, Paulina P., 3,883,555.
Charkoudian, John C., 3,883,350.
Walworth, Vivian K., 3,883,355.

Pollitt, Harry Wilfred Wallace; and Brown, Arthur William, to Associated Portland Cement Manufacturers Limited, The. Portland cements. 3,883,361, Cl. 106-89.000.

Polysar Limited: *See*—
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Polysius AG: *See*—
Ritzmann, Horst; Mollenkopf, Hans; Goldmann, Wolf; Wurr, Jurgen; and Korting, Reinhard, 3,883,294.

Ponticello, Gerald S.; Roberts, F. Edward; and Weinstock, Leonard M., to Merck & Co., Inc. 3-Methylene cephalosporins. 3,883,518, Cl. 260-243.00C.

Poole, Donald R.: *See*—
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Portec, Inc.: *See*—
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Portnoy, Harold D.: *See*—
Schulte, Rudolf R.; and Portnoy, Harold D., 3,882,855.

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Powell, Lawson William: *See*—
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PPG Industries, Inc.: *See*—
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Michalik, Edmund R.; and Neely, James E., Jr., 3,883,339.

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Prada, Luis E.; and Bryant, Jack M., to General Electric Company. Ice bucket retrieving apparatus of a refrigerator. 3,883,204, Cl. 312-273.000.

Pradhan, Ashok H.; and Marton, Fred S., to Westinghouse Electric Corporation. Hybrid analyzer for fast load flow and transient solution of power systems. 3,883,724, Cl. 235-151.210.

Pratt, Ivor; and Boschert, Ulrich, to SCM Corporation. Low-shrink thermosetting polymers. 3,883,612, Cl. 260-862.000.

Pre-Cast Concrete Products, Limited: *See*—
Hahne, Walter B., 3,883,109.

Preisig, Jurg, to Dr. Wrede & Co., Standard-Messgerate Fabrikation. System for metering a substance into liquid flowing in a conduit. 3,882,882, Cl. 137-98.000.

Presnick, Michael C. Collapsible shipping container. 3,883,065, Cl. 229-14.00R.

Prilutsky, Valery Pavlovich: *See*—
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Prince Corporation: *See*—
Zwiep, Theodore C.; Marcus, Konrad H.; and Weitz, Ferdinand, 3,882,570.

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Produits Chimiques, Pechiney-Saint-Gobain: *See*—
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Proudian, Andrew P., to Xonics, Incorporated. Ionography imaging chamber for variable distance X-ray source. 3,883,740, Cl. 250-315.000.

Pryor, Timothy R. Z-factor and other diffractographic displacement and profile sensors. 3,883,249, Cl. 356-109.000.

Puckett, Benjamin V. Hydraulic pump with replaceable pumping member. 3,883,272, Cl. 417-383.000.

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Pullman Incorporated: *See*—
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Purcell, Robert M. Drain extension. 3,882,683, Cl. 61-13.000.

Puri, Yogishwar Kumar, to International Business Machines Corporation. Process for stress testing FET gates without the use of test patterns. 3,883,802, Cl. 324-73.00R.

Quaker Oats Company, The: *See*—
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Quinzer, Milbert. Model aircraft control. 3,882,632, Cl. 46-77.000.

R. A. Jones & Co. Inc.: *See*—
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R.S.R. Corporation: *See*—
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Raabe, Fritz; and de Jong, Eduard, to Plate Bonn Gesellschaft mit beschrankter Haftung. Copolyamides containing caprolactam, laurilactam and hexamethylene diamine adipate. 3,883,485, Cl. 260-78.00L.

Raabe, Fritz; and de Jong, Eduard, to Plate Bonn Gesellschaft mit beschrankter Haftung. Copolyamides containing caprolactam, laurilactam and 11-aminoundecanoic acid. 3,883,487, Cl. 260-78.00L.

Rabizzoni, Antonio; and Trovati, Aldo, to Montedison S.p.A. Process for preparing high molecular weight polyisocyanates. 3,883,577, Cl. 260-471.00C.

Racky, Werner; and Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Flame resistant thermoplastic polyesters. 3,883,474, Cl. 260-45.75B.

Racky, Werner; and Cherdron, Harald, to Hoechst Aktiengesellschaft. Moulding composition of thermoplastic materials. 3,883,475, Cl. 260-45.70P.

Raddatz, Dwight B.: *See*—
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Rafaut & Cie: *See*—
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Raganato, Carlo, to Solvay & Cie. Process for the recovery of synthetic fibrils. 3,883,630, Cl. 264-102.000.

Rakhovsky, Vadim Izrailovich; Stotsky, Gennady Izrailovich; Mazing, Maria Andreevna; and Shustryakov, Valery Mikhailovich. Method and apparatus for measuring concentration of substance in its gaseous phase. 3,883,248, Cl. 356-85.000.

Randall, Eric N., to Corning Glass Works. Method of producing glass in a flame. 3,883,336, Cl. 65-18.000.

Randmere, Uno: *See*—
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Rank Xerox, Ltd.: *See*—
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Rao, Dhulipala M.; and Sutherland, James F., to Westinghouse Electric Corporation. Temperature measuring apparatus and method with resistance amplifier. 3,882,725, Cl. 73-342.000.

Rao, Gadicherla V. R. Quiet fan with non-radial elements. 3,883,264, Cl. 415-119.000.

Rasmussen, Loren H.: *See*—
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Rationator-Maschinenbau GmbH: *See*—
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Rausing, Anders Ruben. Non-returnable packing containers. 3,883,034, Cl. 220-268.000.

Rausing, Gad Anders, to Ladco Enterprises Limited. Cartridge for firearms. 3,882,777, Cl. 102-38.000.

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Razdan, Raj K.; and Pars, Harry G., to Arthur D. Little, Inc. Thienobenzopyrans and thiopyranobenzopyrans. 3,883,551, Cl. 260-327.0TH.

Razdan, Raj Kumar: *See*—
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Thompson, Charles Robert; and Flint, Robert Jones, 3,883,891.
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Rebres, Robert P., to Xerox Corporation. Movable pack advancer. 3,883,133, Cl. 271-122.000.
Recherche et Industrie Therapeutiques (R.I.T.): *See*—
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Reichert, Andrew Ronald: *See*—
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Reiley, Bertrand M.; Muccillo, Edwin J.; and Griffith, Robert G., to Youngstown Sheet and Tube Company. Method of producing seamless tubing. 3,882,595, Cl. 228-158.000.
Reimann, Hans; and Jaret, Robert S., to Schering Corporation. Novel esters of megalomicin A and processes for their preparation. 3,883,507, Cl. 260-210.0AB.
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Remer, Robert K., to Hull-Smith Chemicals, Inc. Absorbent composition. 3,883,438, Cl. 252-1.000.
Renault, Philippe; Dezael, Claude; Deschamps, Andre; and Franckowiak, Sigismond, to Institut Francais du Petrole, des Carburants et Lubrifiants. Process for removing sulfur dioxide and sulfur trioxide from waste gas and producing sulfur therefrom. 3,883,638, Cl. 423-242.000.
Renault, Philippe; Deschamps, Andre; and Dezael, Claude, to Institut Francais du Petrole, des Carburants et Lubrifiants. Process for purifying industrial gases containing sulfur dioxides. 3,883,643, Cl. 423-574.000.
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Renner, Hermann; and Busch, Gerhard, to Daimler-Benz Aktiengesellschaft. Protective padding especially for the backrest and headrest in a motor vehicle. 3,883,155, Cl. 280-150.00B.
Rentmeester, Kenneth Richard; and Godar, Joseph Lambert, Jr., to American Can Company. Easy opening container with safety edge compounds. 3,883,035, Cl. 220-270.000.
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Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Tandem arrays of in-phase couplers. 3,883,827, Cl. 333-10.000.
Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Transformer with adjustable turns ratio. 3,883,829, Cl. 333-11.000.
Seiler, Karl; and Rau, Karlheinz, to Heraeus-Schott Quarzschmelze GmbH. Tubular quartz glass body. 3,882,901, Cl. 138-141.000.
Seiller, Pierre Francois Xavier, to Societe a Responsabilite Limitee dite: Le Presentoir Seiller. Display unit. 3,883,037, Cl. 206-5.000.
Seip, Detlev: *See*—
Matschke, Klaus; Rauterkus, Karl Josef; Seip, Detlev; and Zimmermann, Wolfgang, 3,883,489.
Seki, Takeo: *See*—
Nishizawa, Jun-Ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,883,862.
Sekiya, Mamoru, to Shin-Shirasuna Electric Corporation. Low-frequency power amplifier. 3,883,813, Cl. 330-13.000.
Seleznev, Jury Emelyanovich: *See*—
Burkin, Jury Alexandrovich; and Seleznev, Jury Emelyanovich, 3,883,001.
Sellers, Neal E.: *See*—
Livingstone, Stanley; and Sellers, Neal E., 3,882,698.
Selz, John C. Collapsible wall container. 3,883,026, Cl. 220-6.000.
Semiconductor Research Foundation and Hitachi, Ltd.: *See*—
Nishizawa, Jun-Ichi; Sasaki, Ichiemon; Ishida, Katsuhiko; Tauchi, Syoji; Nishimura, Takeshi; Seki, Takeo; and Kozuma, Noboru, 3,883,862.
Servco Company, a division of Smith International, Inc.: *See*—
Jackson, Hewy E.; and Myers, Howard B., 3,882,594.
Servicemaster Industries Inc.: *See*—
Cannan, Bernard M.; and DeBoo, Daniel A., 3,882,961.

Sessa, Paul A.: *See—*
Ferment, George R.; French, Stuart M.; and Sessa, Paul A., 3,883,718.

SGL Industries, Inc.: *See—*
Fritz, Charles H., 3,882,957.

Shallenberger, Dennis J.: *See—*
Armbrust, William D.; Shallenberger, Dennis J.; and Hill, Charles E., 3,883,282.

Shannon, Edward L.: *See—*
Bone, David P.; and Shannon, Edward L., 3,883,672.

Shanok, Jesse P.: *See—*
Shanok, Victor; Shanok, Jesse P.; and Laszlo, Joseph, 3,882,704.

Shanok, Victor; Shanok, Jesse P.; and Laszlo, Joseph, to Silvatrim Associates. Key mounting device for holding a group of selected keys in a predetermined arrangement. 3,882,704, Cl. 70-456.00R.

Shapiro, Stanley; and Caron, Ronald N., to Olin Corporation. Processing copper base alloys. 3,882,712, Cl. 72-364.000.

Shark, Sam: *See—*
Fischbein, Harold; Fischbein, I. George; and Shark, Sam, 3,882,657.

Sharps Associates: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Dren, Anthony Thomas, 3,883,657.

Shatila, Mounir A., to American Potato Company. Wetting the surfaces of dough pieces prior to frying to eliminate blistering. 3,883,671, Cl. 426-303.000.

Shen, Tsung-Ying; and Jones, Howard, to Merck & Co., Inc. Treatment of pain, fever or inflammation with 5-fluoro-2-methyl-1-opmethylsulfinyl-benzylidene)-3-indenylacetaldehyde. 3,883,660, Cl. 424-303.000.

Shephard, Bernard William; and Draper, Kenneth George, to Ipeco Europe Limited. Seat with thigh support. 3,883,173, Cl. 297-312.000.

Shepherd, Bryan Peter: *See—*
Glover, John Stuart; and Shepherd, Bryan Peter, 3,883,738.

Sherwood, Kenneth C., to Kae-Tee Development Corporation. Simulated bowling game. 3,883,141, Cl. 273-121.00A.

Shibata, Hiroshi; Yamazaki, Yasuo; Kokubu, Yoshikazu; and Okazaki, Isao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Multiple vertical diaphragm type electrolytic cell for producing caustic soda. 3,883,415, Cl. 204-258.000.

Shibata Kagaku Kikai Kogyo Kabushiki: *See—*
Fujinaga, Taitiro; and Miura, Katuo, 3,883,414.

Shiga, Shujiro: *See—*
Yamao, Takashi; and Shiga, Shujiro, 3,883,493.

Shimanckas, William J., to Outboard Marine Corporation. Marine propulsion reversing mechanism. 3,882,814, Cl. 115-34.00R.

Shimizu, Katsuhisa: *See—*
Ueki, Yoshiharu; Maruyama, Yoshio; Magata, Yoshihiro; Fushimi, Akihiro; and Shimizu, Katsuhisa, 3,883,893.

Shimodaira, Tadayoshi; and Tamai, Kazuto, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Device for rotating reciprocally. 3,882,735, Cl. 74-435.000.

Shimojo, Tokuhide: *See—*
Kobayashi, Shunsuke; Shimojo, Tokuhide; and Kasano, Kazuhiko, 3,883,227.

Shin-Shirasuna Electric Corporation: *See—*
Sekiya, Mamoru, 3,883,813.

Shinagawa, Koichiro; and Takahashi, Kiyoko. Glove for protection against injury. 3,882,548, Cl. 2-161.00A.

Shinaki, Michio, to Rank Xerox, Ltd. Detecting and removing apparatus for skew fed sheets. 3,883,134, Cl. 271-261.000.

Shingo, Yoshioki: *See—*
Nakamoto, Teruyuki; Shingo, Yoshioki; Yamaguchi, Tetsuo; and Endo, Yukio, 3,883,443.

Shinmura, Kimio: *See—*
Kume, Tadashi; and Shinmura, Kimio, 3,882,830.

Shinshu Seiki Kabushiki Kaisha: *See—*
Shimodaira, Tadayoshi; and Tamai, Kazuto, 3,882,735.

Shipko, Frederick J.: *See—*
Whittaker, Arthur V.; Whittaker, Ralph E., Jr.; Goldstrom, Robert A.; and Shipko, Frederick J., 3,883,749.

Shirai, Haruji; Honda, Sumio; and Kugua, Hisasi, to Tokyo Automatic Machinery Works Ltd. Apparatus for automatically feeding cigarettes into a hopper of a cigarette packing machine. 3,883,017, Cl. 214-302.000.

Shmatovich, Vitaly Vladislavovichs: *See—*
Volkenau, Vladimir Andreevich; Lavrentiev, Gennady Georgievich; and Shmatovich, Vitaly Vladislavovichs, 3,883,774.

Showalter, Omar V., to Brehm, William L. Sprayer. 3,883,077, Cl. 239-415.000.

Shrader, Robert L.; and Tsujimoto, Kazumi N., to Airco, Inc. Vapor source assembly. 3,883,679, Cl. 13-31.000.

Shugarman, Alvin E.; and Linder, Lowell E., to Electro-Clamp Corporation. Non-shearing solderless electrical connector. 3,883,211, Cl. 339-266.00R.

Shull, William A.: *See—*
Heising, Steven James; Dowley, Mark W.; and Shull, William A., 3,883,818.

Shumakova, Galina Petrovna: *See—*
Mosyakov, Evgeny Alexandrovich; Rtischev, Jury Vasilievich; Berer, Efim Zakharovich; Leus, Vladimir Markovich; Lukeev, Viktor Petrovich; Rodionov, Evgeny Markovich; Levitsky, Vladimir Lvovich; Akopyan, Vladimir Surenovich; Mindlin, Jury Yakovlevich; Balashov, Evgeny Ivanovich; Kinkulkin, Isaak Efimovich; Shumakova, Galina Petrovna; Fedotov, Evgeny Tikhonovich; and Lazarev, Vladimir Fedorovich, 3,883,873.

Shustryakov, Valery Mikhailovich: *See—*
Rakhovsky, Vadim Izrailovich; Stotsky, Gennady Izrailovich; Mazing, Maria Andreevna; and Shustryakov, Valery Mikhailovich, 3,883,248.

Sidebottom, Eric William, to Canadian Industries Limited. Gas generating compositions. 3,883,373, Cl. 149-6.000.

Sieber, Johannes Helmut: *See—*
Fuhring, Heinrich; and Sieber, Johannes Helmut, 3,883,325.

Siegel, David S.: *See—*
Roeder, Robert S.; and Siegel, David S., 3,883,876.

Siegel, Edgar: *See—*
Sommer, Richard; and Siegel, Edgar, 3,883,502.

Siemens Aktiengesellschaft: *See—*
Klein, Erwin; and Lucke, Herbert, 3,883,795.
Steiner, Ewald; and Scholtholt, Hans, 3,882,906.

Sigg-Grutter, Trudi: *See—*
Helmlinger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Sigg-Grutter, Trudi; and Wild, Jost, 3,883,572.

Sigworth, Frederick J., to Systron-Donner Corporation. Impedance plethysmograph. 3,882,851, Cl. 128-2.10Z.

Silberg, Thomas F.: *See—*
Sebastian, Robert W.; Olson, Harry W.; and Silberg, Thomas F., 3,883,705.

Silvatrim Associates: *See—*
Shanok, Victor; Shanok, Jesse P.; and Laszlo, Joseph, 3,882,704.

Silver, Stanley Milton, to Paxall, Inc. Moisture barrier package formed from laminated blank. 3,883,068, Cl. 229-31.00R.

Silverstein, Abraham. Glow plate for internal combustion engine. 3,882,841, Cl. 123-193.0CP.

Simmen, Robert, to Mefina S.A. Mechanically operated fuse for gyratory missiles. 3,882,782, Cl. 102-79.000.

Simon Engineering Dudley Limited: *See—*
Ashworth, Denis Henry, 3,882,963.

Simon, Michael; and Rose, Rolf-Dieter. Electromagnetically driven high-speed elevated railway car system. 3,882,788, Cl. 104-148.0LM.

Simon, Michael; and Rose, Rolf-Dieter. Electromagnetically operated overhung and/or underhung suspension vehicle. 3,882,789, Cl. 104-148.0MS.

Simonsen, Ole Finn, to Dominion Bridge Company Limited. Telescoping post. 3,883,106, Cl. 248-354.00R.

Simpatico, Anthony V., to Avon Products, Inc. Rotary extractor method and apparatus. 3,883,016, Cl. 214-152.000.

Simpkins, Kenneth Wayne. Bicycle conversion device. 3,883,157, Cl. 280-287.000.

Simpson, Henry George: *See—*
Cude, Arthur Leslie; and Simpson, Henry George, 3,882,943.

Simpson, Ronald Olin: *See—*
Ginsberg, Guenter; Godin, Thomas John; and Simpson, Ronald Olin, 3,882,899.

Singer Company, The: *See—*
Flicker, Howard D., 3,882,695.
Schmedtkord, Ultich; Saile, Roland Franz; and Papajewski, Reinhold, 3,883,262.

Singh, Bhupindar; and Swauger, Donald A. Apparatus for suppressing spring action between the wheel mounts and frame of a vehicle. 3,883,153, Cl. 280-124.00R.

Sinhoff, Alfred: *See—*
Stieler, Gerhard; Sinhoff, Alfred; Halmschlag, Otto; and Weckmann, Ferdinand, 3,882,794.

Sinnreich, Manfred. Surgical dilators having insufflating means. 3,882,852, Cl. 128-4.000.

Sivley, Theodore Edward, to Whamco. Electrical power generating apparatus. 3,883,794, Cl. 322-41.000.

Skeeters, William Ronald, to Hasbro Industries, Inc. Device for coating elements of continuous length. 3,882,819, Cl. 118-405.000.

Slaga, Case J., to Advertising Metal Display Co. Cantilever movable panel display rack. 3,883,004, Cl. 211-162.000.

Slaughter, Raymond Jeffrey, to British Insulated Callender's Cables Limited. Optical guides. 3,883,218, Cl. 350-96.00B.

Slinger, William R., to Treadwell Corporation. Air leak detector. 3,882,715, Cl. 73-46.000.

Sloan, Charles T.; and Zaccagnino, Nicholas V., to Bunker Ramo Corporation. Mechanism for bi-directionally driving a print head. 3,882,988, Cl. 197-66.000.

Sloot, Dirk, to Lever Brothers Company. Improving gouda cheese flavor. 3,883,668, Cl. 426-535.000.

Sloot, Dirk: *See—*
Hofman, Hendrik Jan; and Sloot, Dirk, 3,883,667.

Smart, James Crosby, to Imperial Chemical Industries Limited. Sodium percarbonate crystals. 3,883,640, Cl. 423-415.00P.

Smejkal, Hellmuth, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Water-cooled lance or probe destined to be inserted into metallurgical furnaces. 3,882,726, Cl. 73-343.00R.

Smietana, Thaddeus: *See—*
Buchinski, Joseph J.; and Smietana, Thaddeus. 3,882,648.

Smith, Donald H.; and Krueger, Walter H., to Krueger, Walter H. Lock. 3,882,983, Cl. 194-51.000.

Smith, Ernest L., to Phillips Petroleum Company. Reclosable container. 3,883,066, Cl. 229-17.000.

Smith, Gary C., Jr.: *See—*
Viles, Alan H; and Smith, Gary C., Jr., 3,882,891.

Smith, Herbert J.: *See—*
O'Brien, Harry C.; Rubino, James V.; and Smith, Herbert J., 3,883,853.

Smith, Norman L.: *See—*
Ward, Charles F., Jr.; and Smith, Norman L., 3,883,836.

Smith, Robert M., to Cara, Charles, a part interest. Method and apparatus for encouraging return of shopping carts. 3,882,982, Cl. 194-4.00C.

Smith, Vernon O.; and Mossbarger, George E., to Overhead Door Corporation. Hold-down device for dockboard. 3,882,563, Cl. 14-71.000.

SmithKline Corporation: *See—*
DeMarinis, Robert M., 3,883,520.
Sutton, Blaine M.; and Weinstock, Joseph, 3,883,546.

Smolinski, Manfred: *See—*
Winter, Hermann; Smolinski, Manfred; Wolf, Hans-Georg; Roll, Harry; Hoffmann, Kurt; and Jacob, Helmut, 3,883,494.

Snider, Harold F., to Therm-O-Disc Incorporated. Oven for testing or calibrating probe-type thermostats. 3,883,720, Cl. 219-535.000.

Snitgen, Joseph D. Fluid stop mechanism. 3,882,761, Cl. 92-29.000.

Societe a Responsabilite Limitee dite: Le Presentoir Seiller: *See—*
Seiller, Pierre Francois Xavier, 3,883,037.

Societe Anonyme Automobiles Citroen: *See—*
Cadiou, Jean, 3,883,166.

Societe Anonyme des Ateliers de Construction de la Meuse: *See—*
Schaaps, Albert Pierre Ghislain, 3,882,708.

Societe Anonyme des Usines Chausson: *See—*
Plegat, Alain Edouard, 3,882,956.

Societe Anonyme Francaise du Ferodo: *See—*
Odier, Jean, 3,883,610.

Societe Anonyme, Secmer la Tronche: *See—*
Guillaud, Michel Pierre, 3,883,121.

Societe d'Assistance Technique Pour Produits, Nestle S.A.: *See—*
Bouldoires, Jean-Pierre; and Bally, Jacques, 3,882,610.

Societe d'Etudes de Genie Civil et de Techniques Industrielles: *See—*
Muller, Jean, 3,882,564.

Societe Nationale des Petroles d'Aquitaine: *See—*
Mariotti, Jean Francois; Blanc, Jean Henri; and Thibault, Claude, 3,883,599.

Societe Nationale des Poudres et Explosifs: *See—*
Doin, Bernard; and Plantif, Bernard, 3,882,673.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Baudier, Claude Paul; Bouiller, Jean Georges; Teysseyre, Pierre Michel; and Zabukovec, Claude, 3,883,267.
Galmiche, Pierre Michel Andre; Jourdier, Henri Jacques; and Odeyer, Pierre Paul Louis, 3,882,675.

Societe Nationale Industrielle Aerospatiale: *See—*
Violleau, Andre, 3,883,093.

Sokolov, Vladimir Fedorovich: *See—*
Guldenbalk, Alexei Pavlovich; Ivchenko, Vitaly Ivanovich; Kazakevich, Teodor Iosifovich; Koslov, Leonid Pavlovich; Kolosov, Vladimir Grigorievich; Kolosova, Ninel Iosifovna; Melekhin, Viktor Fedorovich; Popandopulo, Leonid Semenovich; Chechurin, Sergei Leonidovich; Ivanov, Pavel Sergeevich; Korolev, Vyacheslav Semenovich; Kushinikov, Vadim Nikolaevich; Sokolov, Vladimir Fedorovich; and Chiganov, Vyacheslav Anatolievich, 3,883,787.

Solodar, Arthur John, to Monsanto Company. Asymmetric reduction of ketones to form optically active alcohols. 3,883,580, Cl. 260-482.00C.

Solovieva, Nadezhda Konstantinovna: *See—*
Zhdanovich, Jury Vasilievich; Lokshin, Galina Borisovna; Kuzovkov, Alexandr Dmitrievich; Rudaya, Sarra Markovna; and Solovieva, Nadezhda Konstantinovna, 3,883,506.

Solvay & Cie: *See—*
Delbouille, Andre; and Derroitte, Jean-Louis, 3,883,492.
Raganato, Carlo, 3,883,630.

Sommars, Mark F.: *See—*
Goloff, Alexander; and Sommars, Mark F., 3,882,834.

Sommer, Richard; and Siegel, Edgar, to Bayer Aktiengesellschaft. Disazo dyestuffs comprising phenyl methane sulfonic acid diazo component coupled to phenyl or naphthyl anine which is diazotized and couples to an indole coupler. 3,883,502, Cl. 260-165.000.

Sons, Charles C., Jr.; and Johnston, Danny L., to Caterpillar Tractor Company. Safety rim. 3,882,919, Cl. 152-410.000.

Sony Corporation: *See—*
Saito, Etsuro; and Matsui, Shooichi, 3,883,856.
Tsurushima, Katsuaki, 3,883,692.

Soukup, Jiri; Varga, Julius; Sterba, Jan; and Bures, Ladislav, to ELITEX, Zavody textilniho strojirenstvi generalni reditelstvi. Device for sequential starting and stopping separate groups of operating means in adjustable time intervals. 3,882,663, Cl. 57-34.00R.

Soulant, Herman A., Jr. Differential lift control by synchronous resonant excitation of air column in helicopter rotor. 3,883,266, Cl. 416-1.000.

Southern Railway Company: *See—*
Miller, J. R., 3,883,118.

Southiere, Bertrand, to Bombardier Limited. Steering column construction. 3,882,948, Cl. 180-5.00R.

Southwire Company: *See—*
Hass, Wynn M., 3,883,278.

Spain, Raymond G. Carbon fiber electrodes for electrical precipitators. 3,883,328, Cl. 55-154.000.

Sperry Rand Corporation: *See—*
Best, Donald T.; and Schwarz, John B., 3,883,816.
Grace, Martin I., 3,883,823.
Lexe, Werner Franz, 3,883,203.
Roeder, Robert S.; and Siegel, David S., 3,883,876.

Sperry-Sun Well Surveying Company: *See—*
Storey, Roy E., Jr., 3,883,788.

Spohn, Robert H. Board game apparatus. 3,883,142, Cl. 273-134.0AC.

Spruz, Yazep Yanovich: *See—*
Giller, Solomon Aronovich; Dubur, Gunar Yanovich; Uldrikis, Yan Rikhardovich; Tirzit, Gunar Jamovich; Valdman, Andrei Robertovich; Zakharchenko, Ivan Markovich; Spruz, Yazep Yanovich; Ronis, Vitaly Evgenievich; and Makarov, Alexandr Andrejevich, 3,883,673.

Stache, Ulrich; and Radscheit, Kurt, to Hoechst Aktiengesellschaft. Process for the manufacture of β-(3-oxo-7α-thioacyl-17β-hydroxy-4-androsten-17α-yl)-propionic acid α-lactones. 3,883,512, Cl. 260-239.570.

Stack, Joseph S., to United States of America, Army. Thermally stable nitrostarch. 3,883,378, Cl. 149-108.000.

Stackman, Robert W.; and Vogt, Clifford M., to Celanese Corporation. Solutions of tetrachlorinated aromatic polyesters in methylene chloride. 3,883,467, Cl. 260-33.80R.

Stackman, Robert W.; and Berardinelli, Frank M., to Celanese Corporation. Composition for use in the formation of three-dimensional flame retardant articles. 3,883,471, Cl. 260-40.00R.

Stahlmann, Rudolf: *See—*
Gawlick, Heinz; and Stahlmann, Rudolf, 3,882,778.
Gawlick, Heinz; Stahlmann, Rudolf; and Jensen, Ernst, 3,882,780.

Stamblesky, Raymond P.; and Jones, William R., to Kruger, John; Friedabaugh, Lee; and Hogg, William N., part interest to each. Method and apparatus for treatment of domestic waste water. 3,883,424, Cl. 210-5.000.

Stanadyne, Inc.: *See—*
Baxter, Leonard N., 3,883,270.

Standard Oil Company: *See—*
Milberger, Ernest C.; Dolhyj, Serge R.; and White, James F., 3,883,573.
Nelson, James P., 3,883,611.
Strukl, Joseph Stephan, 3,883,320.

Starr, Frank Clyde, Jr.: *See—*
Scheuerlein, Edwin Louis; and Starr, Frank Clyde, Jr., 3,883,452.

Starzyk, Eugene J. Stretcher frame for artist's canvas. 3,882,616, Cl. 38-102.100.

State Electricity Commission of Victoria: *See—*
Llewelyn, Richard Penderell; and Hart, John Austin, 3,883,332.

Stauffer Chemical Company: *See—*
Martin, Eugene Ray, 3,883,628.

Stauffer Chemical Corporation: *See—*
Jin, Jung Il; and Kraft, Paul, 3,883,463.

Steckelberg, Willi: *See—*
Schickfluss, Rodolf; and Steckelberg, Willi, 3,883,504.

Steelcase Inc.: *See—*
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Korell, Donald D., 3,882,795.
Mohr, Robert G.; Hodges, Ronald R.; Hockenberry, Jack; Scheerhorn, Douglas; and Wilcox, Gale F., 3,883,196.

Steffel, Horst. Machines for examining pneumatic tires. 3,883,744, Cl. 250-360.000.

Stehlik, Richard C. Raised seat platform. 3,882,557, Cl. 5-114.000.

Steinbrenner, Hans: *See—*
Forster, Hans-Joachim M.; Steinbrenner, Hans; Eltze, Georg; and Florus, Hans-Jorg, 3,882,740.

Steiner, Ewald; and Scholtholt, Hans, to Siemens Aktiengesellschaft. Wire winding machine. 3,882,906, Cl. 140-124.000.

Steinmetz, Gunter: *See—*
Hermann, Walter; Kraus, Peter; and Steinmetz, Gunter, 3,883,098.

Stengel, Edgar: *See—*
Emde, Friedhelm; and Stengel, Edgar, 3,883,006.

Stenstrom, Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Coded signal synchronizing device. 3,883,687, Cl. 178-69.50R.

Stepanek, Bohumil; and Bandoch, Rudolf, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Adjustable needle cam support. 3,882,694, Cl. 66-54.000.

Stephan, Alfred: *See—*
Asztalos, Stefan; Kneuer, Rudolf; Stephan, Alfred; and Glatthaar, Reinhard, 3,882,687.

Stephen, John F., to Ciba-Geigy Corporation. Compositions stabilized with 1,4-disubstituted-7-azabicyclo (2.2.1) heptane-2,5 or 2, 6-dicarboxylic acid esters. 3,883,477, Cl. 260-45.80N.

Stephen, John F.: *See—*
Dexter, Martin; Knell, Martin; Klemchuk, Peter; and Stephen, John F., 3,883,476.

Stephens, Robert Eugene: *See—*
Anderson, Ohmer, Jr.; and Stephens, Robert Eugene, 3,883,131.

Sterba, Jan: *See—*
Soukup, Jiri; Varga, Julius; Sterba, Jan; and Bures, Ladislav, 3,882,663.

Sterling Drug, Inc.: *See—*
Bailey, Denis M., 3,883,516.

Sterling, Walter S., to Pneumatic Scale Corporation. Capper with orienting attachment. 3,882,660, Cl. 53-308.000.

Stern, Ernest: *See—*
Williamson, Richard C.; and Stern, Ernest, 3,883,831.

Sternberg, Moshe, to Miles Laboratories, Inc. Recovery and purification of protein. 3,883,448, Cl. 260-8.000.

Stevens, Robert K. Transportable storage containers. 3,883,005, Cl. 214-1.00N.

Stewart, Earl A.; and Gaboury, William Joseph. Solid waste incinerator. 3,882,802, Cl. 110-14.000.
Stewart, Joseph R.: *See—*
Schwartz, Alfred A.; and Stewart, Joseph R., 3,883,728.
Stewart-Warner Corporation: *See—*
Tramontini, Vernon N., 3,882,932.
Stewart, William H.: *See—*
Brightman, Barrie; Datsko, George; Moll, Edward W.; and Stewart, William H., 3,883,855.
Stieler, Gerhard; Sinhoff, Alfred; Halmschlag, Otto; and Weckmann, Ferdinand, to Waggonfabrik Talbot. Snubbed axle railway bogie. 3,882,794, Cl. 105-224.00R.
Stig Arbman AB: *See—*
Helgesson, Claes Ivar; Persson, Sven Borje Stellan; and Nilsson, Hans-Olof Ingvar, 3,883,337.
Stingelin, Valentin, to Battelle Memorial Institute. Process and apparatus for the production of sheet glass. 3,883,338, Cl. 65-91.000.
Stockel, Dieter: *See—*
Schneider, Friedrich; and Stockel, Dieter, 3,882,587.
Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,883,540.
Stone, Richard D., to Universal Oil Products Company. Edible oil solvent production. 3,883,420, Cl. 208-321.000.
Storage Disk Corporation: *See—*
Johnson, Terry G., 3,883,894.
Storey, Roy E., Jr., to Sperry-Sun Well Surveying Company. Gyroscope orientation controller. 3,883,788, Cl. 318-648.000.
Stotsky, Gennady Izrailovich: *See—*
Rakhovsky, Vadim Izrailovich; Stotsky, Gennady Izrailovich; Mazing, Maria Andreevna; and Shustryakov, Valery Mikhailovich, 3,883,248.
Stouder, Virgil E. Bait bucket assembly. 3,882,628, Cl. 43-55.000.
Stouffer, Richard C.: *See—*
Telmet, Juhan; and Stouffer, Richard C., 3,883,843.
Strader, George C.: *See—*
Goldfarb, Adolph E.; Strader, Judith D.; and Strader, George C., 3,882,633.
Strader, Judith D.: *See—*
Goldfarb, Adolph E.; Strader, Judith D.; and Strader, George C., 3,882,633.
Strater, William H.: *See—*
Badger, John P.; and Strater, William H., 3,883,369.
Stratton, Michael K.: *See—*
Bailey, John M.; Stratton, Michael K.; and Wells, Alan W., 3,882,842.
Streicher, Wolfgang: *See—*
Pailer, Matthias; Takacs, Friedrich; and Streicher, Wolfgang, 3,883,538.
Stressed Pipe Research, Inc.: *See—*
James, Kenneth E., 3,882,905.
Stritzel, Gene A., to Gleason Works, The. Grinding wheel assembly having multiple grinding surfaces for selective engagement with a workpiece. 3,882,646, Cl. 51-204.000.
Strohlein, James Neil. Vehicle power system for limited vehicle movement without use of fuel. 3,882,950, Cl. 180-54.00R.
Strohmeyer, Heinz E.: *See—*
Clemens, John Ewart; Johnstone, Ben B.; and Strohmeyer, Heinz E., 3,882,776.
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Strukl, Joseph Stephan, to Standard Oil Company. Reducing deposits and smoke from jet fuels with additives incorporating an ammonium salt. 3,883,320, Cl. 44-68.000.
Strutz, Glenn L., to Tote Pak Co. Carrying strap construction. 3,882,914, Cl. 150-1.50R.
Stryker Corporation: *See—*
Crim, Paul E.; and Warfield, Wayne, 3,882,737.
Stuart, Richard L.; and Bhopale, Arvind M. Multilevel digital filter. 3,883,727, Cl. 235-152.000.
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Suh, John T.; and Bare, Thomas M., to Colgate-Palmolive Company. Salicylamidophenethanolamines. 3,883,560, Cl. 260-340.500.
Sullivan, William A., Jr., to Xerox Corporation. Apparatus for Developing Electrostatic Latent Images. 3,882,822, Cl. 118-637.000.
Sumitomo Chemical Company, Ltd.: *See—*
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Suozzo, John, to Westinghouse Electric Corporation. Elevator system. 3,882,968, Cl. 187-22.000.
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Sutherland, James F.: *See—*
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Sutton, Blaine M.; and Weinstock, Joseph, to SmithKline Corporation. S-heterocyclic derivatives of phosphine or phosphite gold mercaptides. 3,883,546, Cl. 260-299.000.
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Svaldi, Marvin A.: *See—*
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Svensen, Charles R. Speed wrench tool. 3,882,753, Cl. 81-177.0ST.
Swanson, Eric R. System for providing a reference frequency source. 3,883,874, Cl. 343-105.00R.
Swanson, John L., to A. B. Dick Company. Paper feed control mechanisms. 3,883,132, Cl. 271-110.000.
Swartz, Joseph. Easel. 3,883,108, Cl. 248-460.000.
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Sybertz, Hans, to Hombak Maschinenfabrik KG. Cutter for wood chipper having radially offset blades. 3,882,912, Cl. 144-172.000.
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Sykes, C. S. Knife sharpener. 3,882,642, Cl. 51-157.000.
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Tacussel, Maurice, to Electronique Marcel Dassault. Device for the use in frequency of a short duration electrical signal. 3,883,810, Cl. 328-155.000.
Taggart, Robert. Vortex propeller. 3,882,674, Cl. 60-221.000.
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Takahashi, Isao; Fujii, Motoharu; Kawakubo, Kazuo; Ariga, Masao; and Sugiura, Susumu, to Canon Kabushiki Kaisha. Electronic photographic copying machine. 3,883,242, Cl. 355-3.00R.
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Tanaka, Susumu; Enoguchi, Yuji; and Kawabata, Hidetoshi, to Minolta Camera Kabushiki Kaisha. Stirring and scraping device for developing material. 3,882,823, Cl. 118-637.000.
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Tandon, Jai Prakash; and Durrell, William Sandford, to Ciba-Geigy Corporation. Adiabatic process for the production of 2,4-dichloro-6-amino-S-triazines. 3,883,515, Cl. 260-240.00B.
Tanet, Bernard; and Elias, Bernard, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Devices for absorbing energy by plastic deformation. 3,883,167, Cl. 293-70.000.
Tanigawa, Shizuhiko; and Kanda, Shozo, to Matsushita Electric Industrial Co., Ltd. Device for detecting the rotating phase of rotary magnetic heads of video tape recording apparatus. 3,883,890, Cl. 360-31.000.
Taniguchi, Morimasa: *See—*
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Taniguchi, Takasi. Diaper set. 3,882,871, Cl. 128-287.000.
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Telmet, Juhan; and Stouffer, Richard C., to Allied Chemical Corporation. Seat belt system with starter engine lock and alarm. 3,883,843, Cl. 340-52.00E.
Temple, Robert, to Mine Safety Appliance Company. Buoyant signal flare. 3,882,811, Cl. 114-221.00A.
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Thacker, Vic N.; and Rasmussen, Loren H., to Medco Inc. Method and apparatus for orienting randomly placed rolling elements. 3,882,583, Cl. 29-148.40A.
Thaeler, Bruce K., to Textron Inc. Slide fastener installation and method and slide fastener package for forming the same. 3,883,381, Cl. 156-66.000.
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Thomas, Charles A., Jr.; Zuckerman, James E., Jr.; and Morse, Stephen A., to Charles A. Thomas, Jr. Gonorrhea detecting. 3,883,396, Cl. 195-100.000.
Thomas, Douglas W., to American Home Products Corporation. Dispenser combined with hanging clip for inverted support. 3,883,024, Cl. 215-100.000.
Thomas, Lowell S.; and Cleereman, Kenneth J., to Dow Chemical Company, The. Method for making expandable plastics. 3,883,625, Cl. 264-45.600.
Thomas, Robert M., to GTE Automatic Electric (Canada) Ltd. Analog-to-digital and digital-to-analog converter apparatus. 3,883,864, Cl. 340-347.0AD.
Thomas, Stanley E., Jr. Flexible, reusable fastener. 3,882,573, Cl. 24-30.50T.
Thompson, Charles Robert; and Flint, Robert Jones, to RCA Corporation. Redundant signal processing error reduction technique. 3,883,891, Cl. 360-47.000.
Thompson Dehydrating Company: *See—*
Thompson, Stanley P.; Thompson, Walter T.; Boyert, David L.; and Swearingen, Thomas B., 3,883,327.
Thompson, Leo M.; Anderson, Robert K.; and Kocher, Lawrence H., to Textron Inc. Elastomeric bladder for positive expulsion tank. 3,883,046, Cl. 222-386.500.
Thompson, Stanley P.; Thompson, Walter T.; Boyert, David L.; and Swearingen, Thomas B., to Thompson Dehydrating Company. Method and apparatus for separating particulate matter from a gas stream. 3,883,327, Cl. 55-94.000.
Thompson, Walter T.: *See—*
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Throssell, Walter Robert; and Fryer, Paul Raymond, to International Computers Limited. Circuits for the generation of clock pulses for use with a scanning device. 3,883,737, Cl. 250-235.000.
Thumim, Arnold David, to Packard Instrument Company, Inc. Scintillation counter, maximum gamma aspect. 3,883,741, Cl. 250-328.000.
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Robertovich; Zakharchenko, Ivan Markovich; Spruz, Yazep Yanovich; Ronis, Vitaly Evgenievich; and Makarov, Alexandr Andrejevich, 3,883,673.

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Tokarz, Richard D., to United States of America, America as represented by the United States Energy Research and Development Administration. Method of improving the corrosion resistance of nickel-copper alloys. 3,883,379, Cl. 156-18.000.

Tokiwa, Fumikatsu; Tachibana, Kyozaburo; Minegishi, Yutaka; and Imamura, Tetsuya, to Kao Soap Co., Ltd. Transparent liquid detergent composition. 3,883,447, Cl. 252-546.000.

Tokuhara, Shinji: *See—*
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Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument employing waveshape memories. 3,882,751, Cl. 84-1.010.

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Toonen, Petrus J. J.: *See—*
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Tourek, James C. Beavertooth cutting edge. 3,882,749, Cl. 83-651.000.

Towmotor Corporation: *See—*
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Townsley, Philip McNair, to John Dunn Agencies Ltd. Material for biological degradation of petroleum. 3,883,397, Cl. 195-100.000.

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Toyo Soda Manufacturing Co.; Ltd.: *See—*
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Trofimenko, Swiatoslaw, to du Pont de Nemours, E. I., and Company. Bis(dialkylaminomethyl)-phenylenedipalladium (II) compounds. 3,883,570, Cl. 260-429.00R.

Troisi, George A.; and Gordon, Julian D., to Dunkin' Donuts Incorporated. Automatic donut making system. 3,882,768, Cl. 99-352.000.

Troonen, Hugo; Roelants, Piet; and Boon, Bernard, to Recherche et Industrie Therapeutiques (R.I.T.). New 6-aminopenicillanic acid derivative. 3,883,511, Cl. 260-239.100.

Trosper, Milton French, Jr.: *See—*
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Troutman, James D. Telescopic sight mounting means. 3,882,609, Cl. 33-260.000.

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Troy Equine Products: *See—*
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Try, Robert W.; and Campbell, David W., to Moore Dry Kiln Company of Oregon. Method and apparatus for limiting the concentration of combustible volatiles in dryer emissions. 3,882,612, Cl. 34-27.000.

Tschischow, Nicholas: *See—*
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Tsen, Cho C.; and Hoover, William J., to Kansas State University Research Foundation. Method of increasing the protein content of wheat flour based, low shortening, low sugar baked and fried products. 3,883,669, Cl. 426-549.000.

Tsuji, Nobuo: *See—*
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Tsujimoto, Kazumi N.: *See—*
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Tsunoda, Yoshito, to Hitachi, Ltd. Random phase plate and optical system incorporating said plate. 3,883,232, Cl. 350-314.000.

Tsurushima, Katsuaki, to Sony Corporation. Decoder apparatus with logic circuit for use with a four channel stereo. 3,883,692, Cl. 179-1.0GQ.

Tsutsumi, Takashi: *See—*
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Tsuya, Yuko, to Agency of Industrial Science and Technology. Method for manufacture of abrasion-resistant sliding member. 3,882,584, Cl. 29-149.50S.

Tundermann, Werner O., to Colgate-Palmolive Company. Disposable foot care article and method of manufacture thereof. 3,882,868, Cl. 128-260.000.

Tunison, David W.: *See—*
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Turley, Richard J., to Olin Corporation. Polyhaloalkyl phosphate esters. 3,883,620, Cl. 260-963.000.

Turner, Abner B., to Westinghouse Electric Corporation. Self-contained waste treatment system. 3,882,552, Cl. 4-10.000.

Turner, John, to Geo. W. King Limited. Conveyor systems. 3,882,787, Cl. 104-96.000.

Turner, Robert J.; Booth, David L.; and Berry, Richard D., to Morton-Norwich Products, Inc. 2-(2'ethylhexyl)-quinizarin. 3,883,568, Cl. 260-383.000.

Turner, Robert R.; and Hart, Ralph H., to Aerofall Mills Limited. Vertical classifier. 3,883,423, Cl. 209-143.000.

Ty, Henry: *See—*
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Ueki, Yoshiharu; Maruyama, Yoshio; Magata, Yoshihiro; Fushimi, Akihiro; and Shimizu, Katsuhisa, to Pioneer Electronic Corporation. Magnetic tape recording and reproducing apparatus. 3,883,893, Cl. 360-74.000.

Uldrikis, Yan Rikhardovich: *See—*
Giller, Solomon Aronovich; Dubur, Gunar Yanovich; Uldrikis, Yan Rikhardovich; Tirzit, Gunar Jamovich; Valdman, Andrei Robertovich; Zakharchenko, Ivan Markovich; Spruz, Yazep Yanovich; Ronis, Vitaly Evgenievich; and Makarov, Alexandr Andrejevich, 3,883,673.

Ulyanov, Lev Petrovich. Method for stabilizing conductance of conversion of mechanical displacements into electric signal of capacitance transducer and device for effecting same. 3,883,799, Cl. 324-61.00R.

Umehara, Akira: *See—*
Tamai, Yasuo; Osawa, Sadao; Honjo, Satoru; Umehara, Akira; Yamamoto, Masaya; Tsuji, Nobuo; Takashina, Naomitsu; and Nagashima, Wakio, 3,883,440.

Unger, Joseph Kenneth, to RCA Corporation. Method for conditioning transmission lines utilizing adjustable equalizers and a recording technique. 3,883,703, Cl. 179-175.30R.

Union Carbide Corporation: *See—*
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National Aeronautics and Space Administration; administrator; with respect to an invention of:
Appleberry, Walter T. Device for use in loading tension members. 3,882,719, Cl. 73-143.000.
Cheng, Dah Yu. Reversed cowl flap inlet thrust augmentor. 3,883,095, Cl. 244-53.00B.
David, Robert M.; and Portnoy, William M. Insulated electrocardiographic electrodes. 3,882,846, Cl. 128-2.06E.
Ohlson, John E.; and Williams, William F. System for interference signal nulling by polarization adjustment. 3,883,872, Cl. 343-100.0PE.
Wang, Taylor G.; Saffren, Melvin M.; and Elleman, Daniel D. Material suspension within an acoustically excited resonant chamber. 3,882,732, Cl. 73-505.000.
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Uzzell, Rudyard S., Jr., to Natural Energy Systems, Inc. Method and apparatus for generating power from wind currents. 3,883,750, Cl. 290-55.000.
Valdman, Andrei Robertovich: *See—*
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Vanderveer, Fredric B., to Leigh Products, Inc. Sectional handle. 3,882,569, Cl. 16-114.00R.
van der Waals, Jacobus; and Toonen, Petrus J. J., to Controls Company of America. Fuel oil flow controls. 3,882,888, Cl. 137-410.000.
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Van Peteghem, Antoine: *See—*
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van Roosmalen, Johannes Hendrikus Theodorus; and Vermulst, Joannes Cornelis, to U.S. Philips Corporation. Device comprising a television camera tube. 3,883,773, Cl. 315-10.000.
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Vertex Science Industries, Inc.: *See—*
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Violleau, Andre, to Societe Nationale Industrielle Aerospatiale. Aircraft control elements. 3,883,093, Cl. 244-42.00D.

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Vorms, Georgy Alfonsovich; Kuznetsov, Petr Ivanovich; and Volkov, Vladislav Borisovich. Rotary nozzle for spraying low-caloric fluid viscous substances in process of burning. 3,883,076, Cl. 239-214.230.

Vuaille, Andre. Control rods for the flow per stroke of piston machines, especially injection pumps, and in these machines themselves. 3,883,274, Cl. 417-494.000.

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Watanabe, Masae, to Yamaha Hatsudoki Kabushiki Kaisha. Hydraulic shock absorber. 3,882,977, Cl. 188-322.000.

Watanabe, Takeaki; Sakasegawa, Hiroshi; and Tanabe, Kuniyuki, to Nissan Motor Company Limited. Fuel cooling device in an automotive vehicle equipped with an air conditioner. 3,882,692, Cl. 62-316.000.

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Wenzlaff, Robert, to Breakthrough Research & Development Corp. Automotive distributor circuit breaker with eccentrically mounted, roller bearing type cam. 3,883,707, Cl. 200-30.00R.

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Wiczer, Max. Key for lock anti-pick device. 3,882,702, Cl. 70-406.000.
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Will, Werner: *See—*
Schmidt, Franz; Schenk, Wolfgang; Wurmb, Rolf; Meyer-Simon, Eugen; Thurn, Friedrich M.; and Will, Werner, 3,883,468.
Willand, Allan Howard: *See—*
Kolensky, Leo Michael; Pilc, Randolph John; Schaefer, Walter Rudolph; and Willand, Allan Howard, 3,883,690.
Willard, Frank G., to Westinghouse Electric Corporation. Integrating analog to digital converter with variable time base. 3,883,863, Cl. 340-347.0NT.
Williams, Duane A.: *See—*
McCullough, Foy, Jr.; Williams, Duane A.; Katter, Lincoln B.; and Poole, Donald R., 3,883,154.
Williams, Horace A. Pressure sensing and responding device. 3,882,900, Cl. 137-625.340.
Williams, Larry W. Combined snow-mower. 3,882,615, Cl. 37-43.00L.
Williams, Robert H. Four-phase cycle planetating piston internal combustion engine. 3,882,827, Cl. 123-8.270.
Williams, Thurston V. Adjustable bit holder. 3,882,582, Cl. 29-105.00R.
Williams, William F.: *See—*
United States of America, National Aeronautics and Space Administration; Ohlson, John E.; and Williams, William F., 3,883,872.
Williamson, Richard C.; and Stern, Ernest, to Massachusetts Institute of Technology. Surface wave devices. 3,883,831, Cl. 333-30.00R.
Williamson, William Aplin, to Clark Equipment Company. Control for dual path hydrostatic drive. 3,882,679, Cl. 60-484.000.
Willigman, John: *See—*
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Willshire, Ian Robert: *See—*
Gregory, Harold; and Willshire, Ian Robert, 3,883,497.
Wilson, Freddie W.; Robbins, Albert H.; Ford, Allen G.; and Wilson, Robert A., to United States of America, Navy. Ride quality control for surface effects craft. 3,882,960, Cl. 180-118.000.
Wilson, Joseph M. Clothes dryer. 3,882,613, Cl. 34-48.000.
Wilson, Julia P. Stocking puller. 3,883,052, Cl. 223-111.000.
Wilson, Robert A.: *See—*
Wilson, Freddie W.; Robbins, Albert H.; Ford, Allen G.; and Wilson, Robert A., 3,882,960.
Wilson, Robert M., to Dare Products, Incorporated. Electrical fence-tester having a plurality of connectors for connecting the tester components. 3,883,804, Cl. 324-122.000.
Windelbandt, Herbert. Apparatus for the production of hot gases. 3,883,290, Cl. 431-168.000.
Winkle, Gunther; Schwarzler, Peter; Otto, Peter H.; Molzer, Peter; and Walkner, Christian, to Krauss-Maffei A.G. Rail system for magnetic suspension vehicles. 3,882,790, Cl. 104-148.0MS.
Winter, Hermann; Smolinski, Manfred; Wolf, Hans-Georg; Roll, Harry; Hoffmann, Kurt; and Jacob, Helmut, to Chemische Werke Huls Aktiengesellschaft. Process for the preparation of emulsifier-containing polyvinyl chloride or vinyl chloride copolymer powders. 3,883,494, Cl. 260-92.80A.
Wirstlin, Arthur N.: *See—*
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Wirth, Wayne M., to Minnesota Mining and Manufacturing Company. Locking latch for a disk cartridge. 3,882,701, Cl. 70-63.000.
Wiseman, Gerald M.: *See—*
Cawley, Charles R., Jr.; Wiseman, Gerald M.; and Gabel, John T., 3,883,199.
Wisla, Stanley F.: *See—*
Murphy, John D.; Pirro, John, Jr.; Lawrence, Monsey; and Wisla, Stanley F., 3,883,441.
Wittern, Francis A.; Albright, Henry J.; and Wirstlin, Arthur N., to Fawn Engineering Co. Vending machine flat helix discharge unit. 3,883,039, Cl. 221-75.000.
Wittlinger, Harold Allen, to RCA Corporation. Temperature sensing circuit. 3,882,728, Cl. 73-362.0SC.
Witts, John W.: *See—*
Gross, Heinz; Wade, Harry C.; and Witts, John W., 3,882,706.
Wohnhas, Adolf: *See—*
Krieg, Manfred; and Wohnhas, Adolf, 3,883,617.
Woitun, Eberhard; Narr, Berthold; and Schroter, Wolfgang, to Boehringer Ingelheim G.m.b.H. Pharmaceutical compositions containing a 2-(aminoalkylamino)-4-amino-thieno[3,2-d]pyrimidine and method of use. 3,883,651, Cl. 424-248.000.
Wolf, Erhard H.; and Duffy, Brian J., to American Hoechst Corporation. Quinazoline derivatives. 3,883,524, Cl. 260-247.20A.
Wolf-Gerate GmbH: *See—*
Achenbach, Dieter; Joswig, Siegfried Adolf; and Kolb, Walter, 3,883,789.
Wolf, Hans-Georg: *See—*
Winter, Hermann; Smolinski, Manfred; Wolf, Hans-Georg; Roll, Harry; Hoffmann, Kurt; and Jacob, Helmut, 3,883,494.
Wolf, Irving W.: *See—*
Lienhard, Heinz; Carter, Walter S.; and Wolf, Irving W., 3,883,858.
Wolfe, Denis G.; and Danon, Joseph S., to Robertshaw Controls Company. Thermal responsive switch. 3,883,837, Cl. 337-326.000.
Wolff, Robert C. Liquid transfer system. 3,883,269, Cl. 417-122.000.
Woligrocki, Gordon. Transit system. 3,882,786, Cl. 104-89.000.
Womack, Richard Arthur: *See—*
Cutting, Dale Emerson; Womack, Richard Arthur; and MacGuffie, Joseph Vernon, 3,883,421.
Woo, Charles; and Bichard, John A., to Exxon Research and Engineering Company. Two-stage synthesis of lubricating oil. 3,883,417, Cl. 208-49.000.
Wood, George F., II. Signal means for vehicle retractable step. 3,883,844, Cl. 340-52.00R.
Woodall, Hubert C., Jr., to Carolina Narrow Fabric Company. Orthopedic cast having protective sleeve. 3,882,857, Cl. 128-90.000.
Wooddell, John H.: *See—*
Oldham, Robert R.; and Wooddell, John H., 3,883,427.
Woods, Stephen. Air valve pressure diaphragm carburetor. 3,883,622, Cl. 261-78.00R.
Woodyatt, Louis R.: *See—*
Rohatgi, Pradeep Kumar; and Woodyatt, Louis R., 3,882,942.
Woolley, Robert E., to Bradbury, Linda. Telephone timer. 3,882,670, Cl. 58-145.00K.
Workman, David E.: *See—*
Samhammer, Clair A.; Workman, David E.; and King, Marvin M., 3,883,003.
World Color Press, Inc.: *See—*
Lytle, Gerald H.; and Littleton, F. John, 3,882,775.
World Water Resources, Inc.: *See—*
Hanford, William E., 3,883,429.
Wright, Andrew Charles Walden: *See—*
Newstead, Charles; and Wright, Andrew Charles Walden, 3,882,972.
Wright, Arthur J.: *See—*
Farber, Sheldon; and Wright, Arthur J., 3,883,557.
Wright, Charles M., to United States of America, Navy. 1-Azido-1,1-dinitroalkanes, useful as propellants. 3,883,377, Cl. 149-88.000.
Wright, George C.; Bayless, Allan V.; and Gray, Joseph E., to Morton-Norwich Products, Inc. 3-Benzylpyrido [3,4-e]-as-triazine and 1,2-dihydro-3-benzylpyrido[3,4-e]-as-triazine hydrochloride. 3,883,526, Cl. 260-248.0AS.

Wright, Thomas R.: *See—*
Heinberg, Gary R.; Jones, Darryl S.; and Wright, Thomas R., 3,883,854.

Wunder, Friedrich: *See—*
Fernholz, Hans; Schmidt, Hans-Joachim; and Wunder, Friedrich, 3,883,585.

Wunsch, Gerd: *See—*
Kneller, Eckart; Koester, Eberhard; Wunsch, Gerd; Deigner, Paul; and Graw, Dieter, 3,883,892.

Wurmb, Rolf: *See—*
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Wurr, Jurgen: *See—*
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Wyatt, William B., to Aladdin Industries, Incorporated. Stackable trays and cups. 3,883,029, Cl. 220-23.830.

Xerox Corporation: *See—*
Cloutier, Eugene F.; and Connolly, Douglas P., 3,883,291.
Hamaker, Ralph A., 3,883,292.
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Whitaker, Raymond; and Haslam, Bryan S., 3,883,244.

Xonics, Incorporated: *See—*
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Yagi, Shizuo: *See—*
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Yagihara, Hiroshi: *See—*
Higuchi, Masaru; Ohnishi, Hajime; and Yagihara, Hiroshi, 3,883,464.

Yamada, Junichi; and Terashima, Etuzo, to Hitachi, Ltd. Colour picture tubes. 3,883,770, Cl. 313-403.000.

Yamaguchi, Masaru: *See—*
Ito, Yoshio; Katayama, Hamime; Nitanda, Hiroshi; and Yamaguchi, Masaru, 3,883,240.

Yamaguchi, Tetsuo: *See—*
Nakamoto, Teruyuki; Shingo, Yoshioki; Yamaguchi, Tetsuo; and Endo, Yukio, 3,883,443.

Yamaguchi, Toshiaki; Narita, Keizo; and Wada, Kimihiro, to Nishimura Seisakusho Co., Ltd. Film wrapping apparatus. 3,883,084, Cl. 242-56.00R.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Watanabe, Masae, 3,882,977.

Yamamoto, Katsuro, to Bridgestone Liquefied Gas Company, Ltd. Method of constructing a low temperature liquefied gas tank of a membrane type. 3,882,591, Cl. 29-455.000.

Yamamoto, Kenzo: *See—*
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Yamamoto, Masaya: *See—*
Tamai, Yasuo; Osawa, Sadao; Honjo, Satoru; Umehara, Akira; Yamamoto, Masaya; Tsuji, Nobuo; Takashina, Naomitsu; and Nagashima, Wakio, 3,883,440.

Yamanaka, Shigeru; and Mitsugi, Koji, to Ajinomoto Co., Inc. Method of producing cells of algae. 3,882,635, Cl. 47-1.400.

Yamanouchi, Kenzo: *See—*
Ikegami, Yoshizo; and Yamanouchi, Kenzo, 3,883,684.

Yamao, Takashi; and Shiga, Shujiro, to Sumitomo Chemical Company, Ltd. Method for producing copolymers of 1-olefins with conjugated dienes. 3,883,493, Cl. 260-85.30R.

Yamashita, Tadaoki: *See—*
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Yamazaki, Eiichi; Maruyama, Koichi; Ueda, Toshio; and Ogura, Iwao, to Hitachi, Ltd. Exposure apparatus for manufacturing fluorescent screens of colour picture tubes. 3,883,880, Cl. 354-1.000.

Yamazaki, Yasuo: *See—*
Shibata, Hiroshi; Yamazaki, Yasuo; Kokubu, Yoshikazu; and Okazaki, Isao, 3,883,415.

Yan, Tsoung Y., to Mobil Oil Corporation. Stabilization of lube oil. 3,883,416, Cl. 208-3.000.

Yanagioka, Hiroshi: *See—*
Kanai, Toshio; Noguchi, Masaaki; Yanagioka, Hiroshi; Kogawa, Yosio; and Kondo, Susumu, 3,883,311.

Yancey, John W., to Caterpillar Tractor Company. Stress-Relieved Weldment for Box Sections. 3,882,654, Cl. 52-758.00B.

Yanus, John F.: *See—*
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Yasumatsuya, Noboru: *See—*
Tsukuda, Teruhiro; Yasumatsuya, Noboru; Tsutsumi, Takashi; Saeki, Taiichi; and Hirai, Yasuyoshi, 3,883,780.

Yates, James E.; and Washecheck, Paul H., to Continental Oil Company. Friable compositions and process for producing same. 3,883,362, Cl. 106-268.000.

Yates, James E.; and Pinto, Wilfred M., to Continental Oil Company. Friable composition and process. 3,883,363, Cl. 106-268.000.

Yentsch, Carl H.: *See—*
McGlynn, Thomas P.; and Yentsch, Carl H., 3,883,067.

Yokomichi, Isao: *See—*
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Yokoyama, Iwao; Sasaki, Hiroo; Tanaka, Tetsuo; and Kihara, Keiichi, to Toyo Soda Manufacturing Co., Ltd. Process for preparing esters of omega-aminododecanoic acid. 3,883,586, Cl. 260-404.000.

Yonemaru, Kenichi: *See—*
Miyasaka, Eiji; Yonemaru, Kenichi; and Henmi, Kojiro, 3,883,245.

Yoshida, Takashi: *See—*
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Young, Ferdinand, Jr.: *See—*
Lowderman, Ernest W.; Barrington, Leland L.; and Young, Ferdinand, Jr., 3,883,295.

Young, John M., to Syntex (U.S.A.) Inc. Acne treatment. 3,883,661, Cl. 424-320.000.

Youngman, Gary A., to Universal Oil Products Company. Moving-bed reactor with withdrawal of catalyst and effluent through the same conduit. 3,883,312, Cl. 23-288.00G.

Youngscap, Richard L., to ETS, Ltd. Combined fluid and magnetic transmission system. 3,882,791, Cl. 104-154.000.

Youngstown Sheet and Tube Company: *See—*
Reiley, Bertrand M.; Muccillo, Edwin J.; and Griffith, Robert G., 3,882,595.

Yumde, Yasufumi; and Furuhata, Takashi, to Hitachi, Ltd. Picture signal conversion system. 3,883,685, Cl. 178-6.800.

Yun, Siang-Shen Johnson: *See—*
Harrison, Clarence E., Jr.; and Yun, Siang-Shen Johnson, 3,883,753.

Zabukovec, Claude: *See—*
Baudier, Claude Paul; Bouiller, Jean Georges; Teysseyre, Pierre Michel; and Zabukovec, Claude, 3,883,267.

Zaccagnino, Nicholas V.: *See—*
Sloan, Charles T.; and Zaccagnino, Nicholas V., 3,882,988.

Zackheim, Eli A. Enema syringe. 3,882,866, Cl. 128-235.000.

Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See—*
Fassbender, Rolf, 3,882,678.
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Zajadatz, Heinz: *See—*
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Zakharchenko, Ivan Markovich: *See—*
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Zamkov, Vadim Nikolaevich: *See—*
Gurevich, Samuil; Zamkov, Vadim Nikolaevich; Prilutsky, Valery Pavlovich; Topolsky, Vladimir Filippovich; Podkopai, Nikolai Vasilievich; Dykhno, Semen Leonidovich; and Manoilo, Sergei Afanasievich, 3,883,713.

Zangenfeind, Helmut; and Nagel, Erich, to Agfa-Gevaert Aktiengesellschaft. Apparatus for detecting and guiding the leaders of photographic roll films. 3,883,086, Cl. 242-65.000.

Zarouni, Alfred, to Bell Telephone Laboratories, Incorporated. Communication path fault detector. 3,883,702, Cl. 179-175.30R.

Zelina, William B.; and Allison, Joseph M., to McGraw-Edison. Three phase sequence insensitive full range SCR firing circuit. 3,883,791, Cl. 321-5.000.

Zeltser, Izmail Grigorievich: *See—*
Chemeris, Oleg Nikolaevich; Tretyakov, Evgeny Vasilievich; Didkovsky, Viktor Kirillovich; Kanfer, Vilen Davidovich; Paschenko, Nikolai Konstantinovich; Zeltser, Izmail Grigorievich; Ljukimson, Grigory Mikhailovich; Bashkatov, Alexandr Nikolaevich; Melnikov, Boris Nikolaevich; Medzhibozhsky, Miron Yakovlevich; Goldberg, Ilya Alexandrovich; Juzefovsky, Izrail Abramovich; Ratmansky, Rafail Davidovich; Irkha, Viktor Nikolaevich; Borisov, Jury Nikolaevich; and Kurochkin, Fedor Filippovich, 3,883,078.

Zenith Radio Corporation: *See—*
Kiteley, Terence J., 3,883,779.

Zero Gage Company: *See—*
Macklyn, Bruce A., 3,882,604.
Macklyn, Bruce A., 3,882,608.

Zeuthen, Karl Gustav, to Rexomi A/S. Electrophotographic copying machine and a box-shaped magazine for use in such a machine. 3,883,241, Cl. 355-3.00R.

Zhdanovich, Jury Vasilievich; Lokshin, Galina Borisovna; Kuzovkov, Alexandr Dmitrievich; Rudaya, Sarra Markovna; and Solovieva, Nadezhda Konstantinovna. Chromomycinone glycoside. 3,883,506, Cl. 260-210.0AB.

Ziegenbein, Willi: *See—*
Kopetz, Kurt; Ziegenbein, Willi; and Schick, Anton, 3,883,481.

Zimmer Aktiengesellschaft: *See—*
Gritschke, Martin; and Kretschmann, Bernd, 3,883,082.

Zimmerman, Donald. Dozer drag-beam. 3,882,944, Cl. 172-199.000.

Zimmermann, Manfred: *See—*
Maertens, Dieter; Lehnert, Gunther; and Zimmermann, Manfred, 3,883,495.

Zimmermann, Wolfgang: *See—*
Matschke, Klaus; Rauterkus, Karl Josef; Seip, Detlev; and Zimmermann, Wolfgang, 3,883,489.

Zink, Stanley C., to Black Clawson Company, The. Doctor Blade Assembly. 3,882,817, Cl. 118-126.000.

Ziobro, Norbert M.: *See—*
Chayka, George A.; Persson, Eric J.; and Ziobro, Norbert M., 3,882,597.

Zipper, Walter J. Clip for spectacles. 3,883,236, Cl. 351-112.000.

Zook, Donald G.: *See—*
Grawey, Charles E.; Ball, Glenn A.; and Zook, Donald G., 3,883,287.

Zuckerman, James E., Jr.: *See*—
Thomas, Charles A., Jr.; Zuckerman, James E., Jr.; and Morse, Stephen A., 3,883,396.

Zwiep, Theodore C.; Marcus, Konrad H.; and Weitz, Ferdinand, to Prince Corporation. Method and apparatus for removing an animal foot in the vicinity of the tarsus joint. 3,882,570, Cl. 17-1.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF MAY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Murphy, Preston V., to Thermo Electron Corp. Electret acoustic transducer. Re. 28,420. 5–13–75, Cl. 179—111.
Osrow, Leonard, to Osrow Products Co., Inc. Hand steamer with ironing sole. Re. 28,418, 5–13–75, Cl. 38—69.
Osrow Products Co., Inc.: *See*—
Osrow, Leonard. Re. 28,418.
Schoerner, Roger J., to Southwire Co. Method of fabricating aluminum alloy rod. Re. 28,419, 5–13–75, Cl. 148—2.

LIST OF PLANT PATENTEES

Boll, Herschel L.: *See*—
Cook, Albert B. 3,718.
Hagerstrom, Marion. 3,717.
Cook, Albert B., to Herschel L. Boll. Strawberry plant. 3,718, 5–13–75, Cl. 49.
Hagerstrom, Marion, to Herschel L. Boll. Raspberry plant. 3,717, 5–13–75, Cl. 46.
Weeks, O. L. Rose plant. 3,719, 5–13–75, Cl. 14.

LIST OF DESIGN PATENTEES

Achenbach, Walter B., to Owens-Illinois, Inc. Canister lid or similar article. 235,090, 5–13–75, Cl. D7—131.
Adler, David T. Flexible support for dental and surgical instruments. 235,107, 5–13–75, Cl. D24—1.
Aspell, Thomas A., Jr.: *See*—
Murphy, Joseph W., Taylor, and Aspell. 235,094.
Astec Industries, Inc.: *See*—
Mohr, Frederick A. 235,096.
Blessing-Werke KG: *See*—
Kroner, Klaus. 235,093.
Caterpillar Tractor Co.: *See*—
Hendrickson, Vergil P., Johnson, H. M. and V. H., and Rosenberger. 235,113.
Cornwall Corp.: *See*—
Lloveras, George T. 235,089.
Daenen, Robert, to Dart Industries Inc. Combined letter opener and measuring instrument. 235,091, 5–13–75, Cl. D8—104.
Dart Industries Inc.: *See*—
Daenen, Robert. 235,091.
Davis, Myron F., Jr., and W. Furlani, to International Business Machines, Inc. Hand held printer. 235,116, 5–13–75, Cl. D64—11.
Davis, Wilburn A. Saddle horn lassoing trainer. 235,097, 5–13–75, Cl. D19—62.
DeLuca, Paul V., to Porta Systems Corp. Universal connector block for telephone frame equipment. 235,108, 5–13–75, Cl. D26—14.
Doman, Donald W., to Kohler Co. Faucet handle. 235,098, 5–13–75, Cl. D23—29.
Doman, Donald W., to Kohler Co. Spout. 235,099, 5–13–75, Cl. D23—32.
Doman, Donald W., to Kohler Co. Bath tub. 235,105, 5–13–75, Cl. D23—55.
Doman, Donald W., to Kohler Co. Combined bathtub and plumbing fixtures therefor. 235,106, 5–13–75, Cl. D23—56.
Eastman, Ness: *See*—
Lovitz, David D., Eastman, and Davidson. 235,111.
Erickson, Frederick J. Portable and foldable barbecue. 235,088, 5–13–75, Cl. D7—110.
Fisher, Morris F., to Mohasco Corp. Chair. 235,087, 5–13–75, Cl. D6—71.
Furlani, Walter: *See*—
Davis, Myron F., Jr., and Furlani. 235,116.
Hartz Mountain Corp., The: *See*—
Lovitz, David D., Eastman, and Davidson. 235,111.
Hendrickson, Vergil P., H. M. and V. H. Johnson, and P. C. Rosenberger, to Caterpillar Tractor Co. Motor grader vehicle. 235,113, 5–13–75, Cl. D40—5.
Hurley, Jerry L.: *See*—
Steenhoven, Frank V., and Hurley. 235,114.
International Business Machines, Inc.: *See*—
Davis, Myron F., Jr., and Furlani. 235,116.
Johnson, Harold M.: *See*—
Hendrickson, Vergil P., H. M. and V. H. Johnson, and Rosenberger. 235,113.
Johnson, Virgil H.: *See*—
Hendrickson, Vergil P., H. M. and V. H. Johnson, and Rosenberger. 235,113.
Kephart, Lynn H. Table. 235,084, 5–13–75, Cl. D6—27.
Kohler Co.: *See*—
Doman, Donald W. 235,098.
Doman, Donald W. 235,099.
Doman, Donald W. 235,105.
Doman, Donald W. 235,106.
Kroner, Klaus, to Blessing-Werke KG. Combined travel clock and case. 235,093, 5–13–75, Cl. D10—18.
Lanier Electronic Laboratory, Inc.: *See*—
Walz, David K. 235,109.
Walz, David K. 235,110.
Leary, Donald J., to Owens-Illinois, Inc. Bottle. 235,092, 5–13–75, Cl. D9—149.
Link, Manfred, to Triumph Werke Nurnberg A.G. Typewriter. 235,115, 5–13–75, Cl. D64—11.
Lloveras, George T., to Cornwall Corp. Broiler. 235,089, 5–13–75, Cl. D7—126.
Lovitz, David D., N. Eastman and W. H. Davidson, to The Hartz Mount Corp. Small animal playground. 235,111, 5–13–75, Cl. D30—1.
Maroschak, Ernest J., to Plastic Tubing, Inc. Corrugated pipe. 235,100, 5–13–75, Cl. D23—45.
Maroschak, Ernest J., to Plastic Tubing, Inc. Corrugated pipe. 235,101, 5–13–75, Cl. D23—45.
Maroschak, Ernest J., to Plastic Tubing, Inc. Corrugated pipe. 235,102, 5–13–75, Cl. D23—45.
Maroschak, Ernest J., to Plastic Tubing, Inc. Corrugated pipe. 235,103, 5–13–75, Cl. D23—45.
Maroschak, Ernest J., to Plastic Tubing, Inc. Corrugated pipe. 235,104, 5–13–75, Cl. D23—45.
Mergenov, George, to Mohasco Corp. Chair. 235,086, 5–13–75, Cl. D6—68.
Mohasco Corp.: *See*—
Fisher, Morris F. 235,087.
Mergenov, George. 235,086.
Winrow, Thomas. 235,085.
Mohr, Frederick A., to Astec Industries, Inc. Asphalt plant tower. 235,096, 5–13–75, Cl. D13—1.
Murphy, Joseph W., W. A. Taylor, and T. A. Aspell, Jr. Marine lifesaver radio beacon. 235,094, 5–13–75, Cl. D10—109.
Owens-Illinois, Inc.: *See*—
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Plastic Tubing, Inc.: *See*—
Maroschak, Ernest J. 235,100–104.
Porta Systems Corp.: *See*—
DeLuca, Paul V. 235,108.
Reese, James T. Golf game board. 235,112, 5–13–75, Cl. D34—5.
Rosenberger, Paul C.: *See*—
Hendrickson, Vergil P., H. M. and V. H. Johnson, and Rosenberger. 235,113.
Stamm, Peter, to Telesco Brophey Ltd. Umbrella handle. 235,117, 5–13–75, Cl. D88—3.
Steenhoven, Frank V., and J. L. Hurley, to Westinghouse Electric Co. Twin lamp luminare. 235,114, 5–13–75, Cl. D48—23.
Struben, Francis L. Combined entrance staircase and enclosed storage compartment for mobile homes. 235,095, 5–13–75, Cl. D13—7.
Taylor, Wayne A.: *See*—
Murphy, Joseph W., Taylor, and Aspell. 235,094.
Telesco Brophey Ltd.: *See*—
Stamm, Peter. 235,117.
Triumph Werke Nurnberg A.G.: *See*—
Link, Manfred. 235,115.
Walz, David K., to Lanier Electronic Laboratory, Inc. Dictation recording and playback apparatus or similar article. 235,109, 5–13–75, Cl. D26—14.
Walz, David K., to Lanier Electronic Laboratory, Inc. Transcription playback apparatus or similar article. 235,110, 5–13–75, Cl. D26—14.
Westinghouse Electric Co.: *See*—
Steenhoven, Frank V., and Hurley. 235,114.
Winrow, Thomas, to Mohasco Corp. Chair. 235,085, 5–13–75, Cl. D6—68.

CLAS
3R
161A
244
CLAS
1
CLAS
10
185B
CLAS
10R
81R
109
114
118
334R
CLAS
8.1R
CLAS
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115.7
158
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24.5
142P
CLASS
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CLASS
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77
CLASS
104.3SN
104.3R
250.36
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CLASS
114R
CLASS
1R
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CLASS
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CLASS
230B
253R
254E
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273R
288G
301SP
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11S
30.5T
73B
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265R
CLASS
55R
CLASS
1.6
CLASS
95A
95R
105R
148.4A
149.5S
150
182.5
183.5
203HT
268
419R
427
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CLASSIFICATION OF PATENTS

ISSUED MAY 13, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
3R 3,882,546
3,882,547
161A 3,882,548
244 3,882,549

CLASS 3
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CLASS 4
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185B 3,882,553

CLASS 5
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CLASS 7
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CLASS 85
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CLASS 87
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CLASS 90
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CLASS 92
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103 3,882,784

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267 3,882,878

CLASS 132
92R 3,882,879

CLASS 134
52 3,883,366

CLASS 135
44 3,882,880

CLASS 136
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86A 3,883,368
176 3,883,369

CLASS 137
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627.5 3,882,899

CLASS 138
141 3,882,901

CLASS 139
190 3,882,902
192 3,882,903
213 3,882,904

CLASS 140
92.1 3,882,905
124 3,882,906
149 3,882,907

CLASS 141
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286 3,882,909

CLASS 144
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CLASS 149
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19.8 3,883,374
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88 3,883,377
108 3,883,378

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CLASS 151
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CLASS 152
213R 3,882,918
410 3,882,919

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583 3,883,389
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266 3,882,921

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126 3,882,932
163 3,882,933
164 3,882,934

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224A 3,882,935
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267 3,882,937
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CLASS 172
199 3,882,944

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82C 3,882,955
89A 3,882,956
104 3,882,957
105E 3,882,958
114 3,882,959
118 3,882,960

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50 3,882,961
154 3,882,962

CLASS 182
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CLASS 184
103R 3,882,967

CLASS 187
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29R 3,882,969

CLASS 188
1C 3,882,970
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72.5 3,882,972
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322 3,882,977

CLASS 191
32 3,882,978

CLASS 192
3.57 3,882,980
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CLASS 193
40 3,882,981

CLASS 194
4C 3,882,982
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94 3,882,984

CLASS 195
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63 3,883,394
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3,883,397
127 3,883,398

CLASS 197
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16 3,882,987
66 3,882,988
151 3,882,989
181 3,882,990

CLASS 198
19 3,882,991
24 3,882,992
26 3,882,993
165 3,882,995
220DB 3,882,996
224 3,882,997
253 3,882,994
287 3,882,998

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5EB 3,883,704
6B 3,883,705
11A 3,883,706
30R 3,883,707
38R 3,883,708
144B 3,883,709
156 3,883,710

CLASS 201
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CLASS 202
180 3,883,400

CLASS 203
91 3,883,401

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158R 3,883,407
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195R 3,883,414
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258 3,883,415

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75 3,883,039
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CLASS 222
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518 3,883,048
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CLASS 224
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CLASS 225
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103 3,883,055
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CLASS 226
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CLASS 238
338 3,883,072

CLASS 239
77 3,883,073
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167R 3,883,098

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460 3,883,108

CLASS 249
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187 3,883,110

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DESIGN PATENTS

3	:	235,089	17	:	235,085	34	:	235,086		235,101	
6	:	235,094			235,113			235,111		235,102	
12	:	235,116	18	:	235,087	36	:	235,107		235,103	
13	:	235,109	19	:	235,088			235,108		235,104	
		235,110	24	:	235,095	37	:	235,100	39	: 235,090	

		235,092			235,097						
		235,112	53	:	235,099						
		235,114	55	:	235,098						
47	:	235,096			235,105						
48	:	235,084			235,106						

PLANT PATENTS

6	:	3,719	18	:	3,718	27	:	3,717			

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U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*